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On Health of Agriculture . . .

Government and Industry Speakers Show Contrasting Viewpoints as NPFI Meets

A MARKED contrast between the viewpoints on the farm situation by government administration officials and private industry was brought before the 780 persons attending the National Plant Food Institute convention at the Greenbrier Hotel, White Sulphur Springs, W. Va., June 11-14. Whereas the farmer was pictured as low man on the U.S. economic totem pole by Orville L. Freeman, secretary of agriculture, the same farmer was regarded in an entirely different light by J. E. Streetman, vice president and director of marketing for Ralston Purina Co., St. Louis, Mo.

Mr. Streetman declared that the farmer will continue to need the fertilizer industry's products and services. "The farmer is not going out of business . . . he is going into bigger business," Mr. Streetman emphasized. "The farmer's investment is larger, his risks are greater. But this larger, more efficient farmer approaches his problems and studies his investments as an industrialist does."

Mr. Freeman and Mr. Streetman were speakers on successive days at the NPFI convention, but the contrasting viewpoints of the two brought a considerable amount of comment from conventioneers in conversations in halls, private rooms and on the golf course.

Other speakers sounded optimistic notes, too. Despite the inroads of unfavorable weather in some areas early this season, plus the reaction to the government's emergency feed grain program in taking additional land out of production, the use of higher analysis fertilizers should enable the industry to maintain high level sales of pri-

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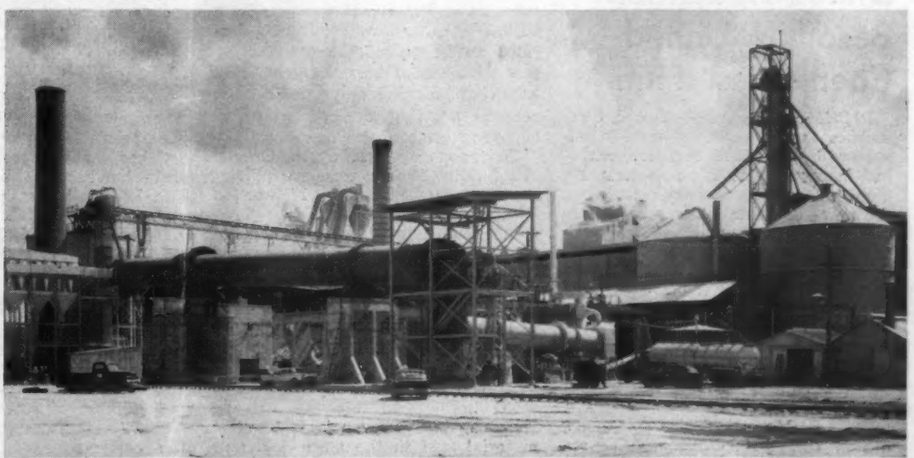

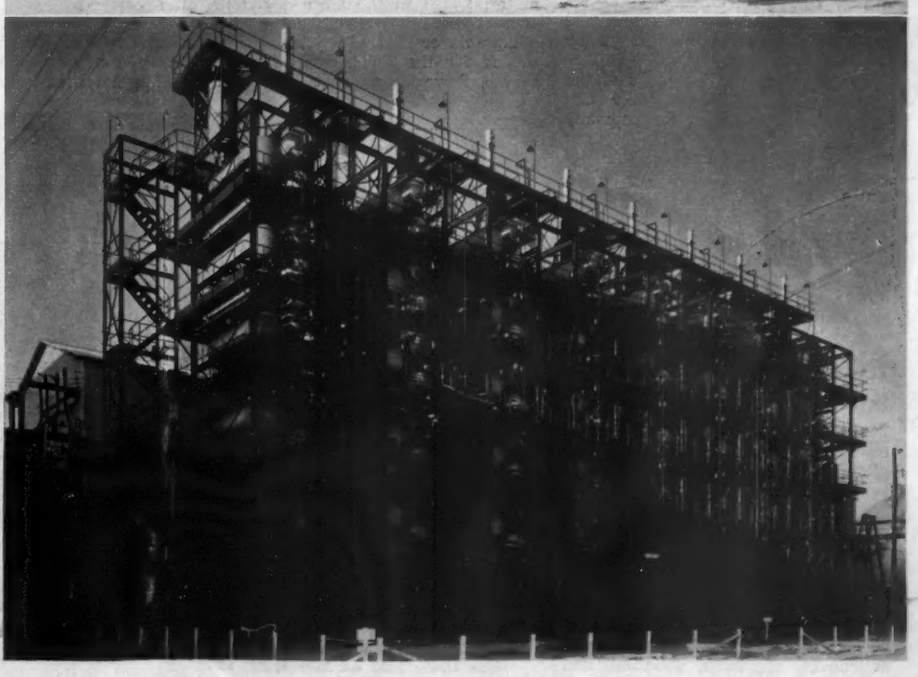

EXPANSION SCENES—Top photo shows new 10 ft. by 160 ft. rotary kiln installed by Virginia-Carolina Chemical Corp. at its calcined phosphate rock operations at Nichols, Fla. The new kiln is said to have increased V-C's capacity by 400,000 tons. (Story on page 29.)

Lower photograph: Expansion activities at Jayhawk Works of Spencer Chemical Co., Pittsburg, Kan. The plant is being enlarged to provide additional nitric acid capacity for production of new 30-10-0 fertilizer. (Story on page 38.)

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What's Going On In The Trade?

Latest Industry Developments...

Southern Nitrogen Co. to Start $5 Million Program

SAVANNAH, GA. — Southern Nitrogen Co., Inc., announced on June 29 that it is launching a $5 million expansion program, principal additional facilities of which will be located at the Savannah Works. Anhydrous ammonia production at Savannah will be increased by 50%, according to John R. Riley, president. Production will be stepped up from 100,000 tons a year to 150,000 tons. It is expected that the new facilities will be in operation by July, 1962, the company says.

Mr. Riley points out that about 90% of the company's business is conducted in the states of Georgia, Florida, North Carolina and South Carolina, and that the expansion was regarded as necessary to meet added demands on the company's output. The president said that his company will begin receiving ammonia at Tampa, Fla., under a purchase contract with Tennessee Corp. This program will bring in 30,000 tons of ammonia a year, Mr. Riley said, but added that requirements are expected to be higher.

Southern Nitrogen is also expanding its nitric acid and ammonium nitrate production at Savannah at a cost of $1.3 million. When this expansion is complete, Mr. Riley said, the company will have enough capacity to process the additional ammonia into end products.

The company began operations in 1957. It produces nitrogen solutions, prilled ammonium nitrate, ammonium nitrate limestone, aqua ammonia and urea.

United-Heckathorn Becomes "United Chemetrics" Firm

RICHMOND, CAL. — United Chemetrics is the new corporate name succeeding United-Heckathorn, chemical manufacturer. The new company name more appropriately describes the new corporate makeup of chemicals, real estate properties and electronics, the company said. The properties and electronics business now merged into United Chemetrics were acquired by the sale of stock to Michael Grayson of Beverly Hills, Cal.

Mr. Grayson becomes United Chemetrics' controlling stockholder and board chairman. E. S. Heckathorn and L. R. Moretti, major stockholders in United-Heckathorn, have resigned as officers and directors and their stock has been purchased by the company.

In the reorganization plans of the company, the major fertilizer and airplane divisions of the company have been sold and the company plans are to consolidate and expand its pesticide business in the West. United Chemetrics has now authorized capital of $15 million in its capital structure.

Officers of United Chemetrics are: Ivor R. Burden, president; Tom L. Moore, vice president and secretary, and Philip Earl, treasurer.

Tolerance Set for Thiodan Insecticide on 10 Crops

MIDDLEPORT, N.Y. — Establishment of tolerances for Thiodan® insecticide on 10 different fruit and vegetable crops was announced recently by Stuart Bear, manager of Niagara Chemical Division, Food Machinery and Chemical Corp. According to Mr. Bear, the Food and Drug Administration has granted tolerances for residues of 2 ppm Thiodan insecticide on apples, pears, peaches, apricots, nectarines, grapes, artichokes, eggplants, tomatoes, and peppers.

Weed Society Plans December Convention

ST. LOUIS, MO.—The Weed Society of America will meet at the Jefferson Hotel here Dec. 11-14, according to K. P. Buchholtz, University of Wisconsin, WSA president. The North Central Weed Control Conference will act as host for the meeting.

Some 1,000 research and education workers representing colleges, chemical companies, equipment manufacturers, public service organizations, public health and regulatory agencies, and others are expected to attend.

Various aspects of weed control research and practical application will be covered by speakers representing 11 sections. The program also will include tours of the agricultural research laboratories of the Monsanto Chemical Co.

New Pesticide Laws Seen in Many States as Legislatures Consider Licenses and Taxes

WASHINGTON — State legislatures around the nation have been very much aware of pesticides, as reflected in legislation already enacted and by other laws apparently destined to be passed. New taxes on pesticides and more stringent laws requiring licensing of pesticide sales people, including dealers, were included in some of the new laws.

The states of Washington, Oregon and South Carolina enacted individualistic new legislation. It was in Washington state where the lawmakers voted to license all sellers of pesticides. State officials are reported to concede that the measure was designed to reduce pesticide sales throughout the state, and revenue from the licenses will be used to enforce the state's laws concerning chemical products used on the farm.

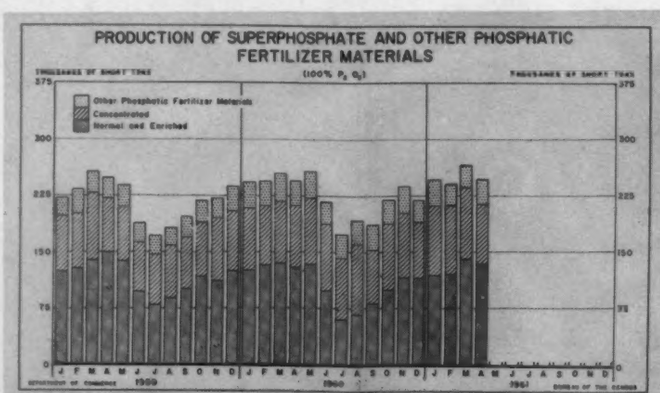
Oregon enacted a special tax on 2,4-D herbicides. This tax will be levied against every pound of active material sold in the state. Industry sources were not sure whether the manufacturer or the retailer will be tapped for the tax. From whatever source, however, the tax funds will be used to finance research at Oregon State University to determine whether herbicides, including 2,4-D, are damaging crops in the state.

Fees in South Carolina were given a big hike, to the extent of 450%. This added revenue is to be used expressly by the state to cover registration expenses and to step up its laboratory staff work in connection with pesticide registration.

Other states were less drastic in their handling of pesticide legislation. Illinois, Nebraska and West Virginia, in enacting their first pesticide statutes, patterned their rules after the Federal Insecticide, Rodenticide and Fungicide Act.

Some ten or twelve states amended their insecticide acts to include coverage of plant regulators, nematocides, defoliants and desiccants. Similar laws were made on the federal level in 1960.

A number of states had not completed their legislative sessions by the early part of July. Alabama, Delaware, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Pennsylvania, Vermont and Wisconsin still had legislatures in session.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Other Phosphatic Fertilizer Materials Concentrated Normal and Enriched
375
300
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1959
1960
1961

PHOSPHATE PRODUCTION—April production of superphosphate and other phosphatic fertilizer materials amounted to 246,309 tons, compared with the output of April, 1960, of 242,607 tons. Shipments of superphosphate and other phosphatic fertilizer materials during the month, however, were 2% below the volume shipped during the corresponding month of 1960, according to a report by the U.S. Department of Commerce Bureau of the Census. The report adds that stocks held by producing plants as of April 30, 1961 totaled 272,141 tons, 22% less than those held on March 31, 1961.

1961 Expected to Set Record for New Chemical Expansion

Peak of $1.7 Billion May Be Reached, U.S. Figures Indicate

WASHINGTON—Expenditures on new plant and equipment by chemical companies are expected to reach a new peak of $1,730 million in 1961, according to preliminary figures released by the Office of Business Economics and the Securities and Exchange Commission. This sum is 8% more than expenditures in 1960 and tops the previous peak of $1,724 million reached in 1957.

During the past decade such capital expenditures have been $1 billion or more annually. Construction of new plants and modernization and expansion of older facilities are needed as existing markets are expanded and new ones discovered through market research activities.

Chemical production and research facilities costing an estimated $2,510 million will be constructed in the U.S. in 1961-62, according to a survey of the Manufacturing Chemists Assn. About 70%, or $1,737 million, of this amount will be for construction already begun, the remainder for planned facilities. Projects totaling $1,041 million were completed in 1960, making total construction costs for the chemical industry in the 3-year period 1960-62 more than $3.5 billion. These costs represent only privately financed projects of 348 companies for 1,061 projects in 520 communities in 44 states.

Companies whose main activities are in non-chemical fields represented 30% of the total number of companies reporting new plant and expansion expenditures for construction for chemical products.

Of the total, new expenditures for fertilizer manufacturing facilities account for $225 million, and miscellaneous chemicals, $232 million. Organic chemicals as a group represent the largest outlay, with a total of $922 million for facilities under construction or planned.

Inorganics were second, with $649 million.

Geographically, the West South Central region, composed of Arkansas, Louisiana, Oklahoma, and Texas, with a total of $919 million, continued to rank first, a position which it has held for several years.

Texas continued to rank as the number one state in terms of total construction funds, $862 million. Other states with large amounts for facilities planned or underway were Louisiana, $188 million; California, $125; Ohio, $117; Florida, $109, and New Jersey, $102 million.

FLIER KILLED

DEWITT, ARK. — Donald R. McDonald, 21, was killed June 26 when his light plane crashed in a field near here. He was flying for the A&M Flying Service of DeWitt and had been applying liquid fertilizer on a rice field. Authorities were unable to state a definite cause of the crash, since there were no trees or wires near by.

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NPFI CONVENTION

Continued from page 1

mary nutrients, although a drop is expected in over-all tonnages, it was pointed out.

Additional talks were presented by Dr. Pierre Rinfret, vice president and director of economics division, Lionel D. Edie & Co., Inc., New York; Willard M. Fifield, provost for agriculture, University of Florida, Gainesville, and Dr. Henry L. Ahlgren, associate director, agricultural extension service, University of Wisconsin.

Soil management awards for editors were presented by J. D. Stewart, Jr., Federal Chemical Co., Louisville, Ky., chairman of the NPFI board of directors, and a presentation of distinguished service citations to past presidents and past chairmen of the NPFI board was made by Paul T. Truitt, NPFI president.

In his address, "Future Role of Agricultural Extension," Dr. Ahlgren predicted that American agriculture "will continue to be an expanding industry in every important respect excepting one—the number of people required to operate our farms."

In addition, he said, "Based on current information and trends, it appears likely that the situation on our farms will develop about as follows during the period of the next 15 to 25 years:

"Our agricultural plant will require more capital, more science and technology, more managerial ability, and more purchased production inputs.

"Commercial family farms will be larger.

"Satisfactory opportunities which will provide a good level of living will be available to only about 10 to 15% of rural farm boys. Thus, it will be necessary for most farm boys and girls to make adjustments from farm to non-farm living.

"The number of farms will continue to decrease.

"Part-time farming will increase.

"There will be an increase in the number of businesses supplying materials and services to farmers and in handling, processing and distributing farm products.

"Vertical and horizontal integration—especially of perishable commodities—will increase.

"Many of the products of agriculture will be produced according to specification and sold under contract.

"Farmers will have increased competition from industry-made substitutes for farm products and from foreign countries.

"More people will work part-time off the farm.

"The farm segment of the economy will become increasingly dependent on other segments of our economy. Thus, farm people will need a much broader understanding of public affairs than they have today.

"The trend in the direction of the merging of rural and urban communities—resulting in larger communities — often with no distinct boundaries—will continue.

"The 'frontier of the mind' as it relates to agriculture will increasingly replace the 'frontier of geography.' New knowledge—and its application—will be the most important 'commodity' in tomorrow's agricultural world.

"The average value of productive cropland will continue to increase.

"The population will continue to increase, perhaps by as much as 25 to 30% by 1975 and to double its present level by the year 2000.

"More people will live in the country than ever before—but most of them will be non-farmers.

"Agriculture will get a smaller share of a much larger national income.

"Individual farm incomes and standards of living—in relation to other occupations — will be higher than they are today.

"Attitudes toward work and leisure time are changing and they will continue to change.

"The productivity of American agriculture will continue to increase —and our most important problem —as it is today—will be in learning how to live with our abundance, and finally—there will be an increasing need for able and dedicated farm leadership."

Dr. Ahlgren said, "There is an increasing need to develop a number of national extension goals," adding that "as the educational arm of the U.S. Department of Agriculture, and as the recipient of substantial federal appropriations, the extension service should properly be concerned and interested in national problems of surpluses, conservation, international trade and the like."

AT NPFI MEETING—Top photo: Speakers on program of National Plant Food Institute convention discuss program with Paul T. Truitt, right, president of the institute. Speakers, from left to right, are: Willard M. Fifield, University of Florida, Gainesville; Henry L. Ahlgren, University of Wisconsin, and J. E. Streetman, Ralston Purina Co., St. Louis, Mo. In lower photo, Mr. Truitt, right, congratulates past officers of the institute and its predecessor organizations, upon their receiving honorary plaques in recognition of service rendered. From left to right are: Richard E. Bennett, Farm Fertilizers, Inc., Omaha, Neb.; Edwin Pate, Dixie Guano Co., Laurinburg, N.C.; L. Dudley George, Richmond Guano Co., Richmond, Va.; J. D. Stewart, Jr., Federal Chemical Co., Louisville, Ky., and Mr. Truitt. Former officers absent when picture was taken, are: E. A. Geoghegan, Southern Cotton Oil Co.; C. T. Prindeville, Swift & Co., Chicago, and John A. Miller, retired.

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Plant Food Institute Re-elects P. T. Truitt; Names John Hall as Chairman of NPFI Board

WHITE SULPHUR SPRINGS, W. VA.—The board of directors of the National Plant Food Institute on June 14 elected John W. Hall, president of Potash Company of America, Denver, Colo., as chairman of the board, and Elwood I. Lentz, vice president of Western Phosphates, Inc., Salt Lake City, Utah, as vice chairman of the board, at the conclusion of the NPFI convention at the Greenbrier.

Other officers of the Institute, all of Washington, D. C., were re-elected as follows: Paul T. Truitt, president; W. R. Allstetter, vice president; Louis H. Wilson, secretary; and William S. Ritnour, treasurer.

Members of the executive committee elected by the board are: J. C. Denton, president of Spencer Chemical Co., Kansas City, Mo.; James F. Doetsch, president of Chilean Nitrate Sales Corp., New York,; Mr. Hall; Joseph J. Lanter, president, Central Farmers Fertilizer Co., Chicago; Mr. Lentz; William E. McGuirk, Jr., president of the Davison Chemical Division of W. R. Grace & Co., Baltimore, Md.; C. T. Prindeville, vice president of Swift & Co., Chicago; E. N. Shelton, vice president of The Tennessee Corp., New York; Fred J. Woods, president of The Gulf Fertilizer Co., Tampa, Fla.; and Mr. Truitt, (ex-officio). J. D. Stewart, Jr., retiring chairman of the board and president of the Federal Chemical Co., Louisville, Ky. remains on the committee as an advisory member.

At the business meeting on June 12, members of the Institute elected 12 new members of its board of directors for terms expiring in June 1964, as follows: Willard Ashburn, Smith-Douglass Co., Inc., Norfolk, Va.; Thomas W. Childs, Southwest Potash Corp., New York; Howard J. Grady, California Chemical Co., Richmond, Cal.; Robert U. Haslanger, Escambia Chemical Corp., New York; Stanley Learned, Phillips Petroleum Co., Bartlesville, Okla.; Fred L. Litty, Northern Chemical Industries, Inc., Baltimore, Md.; Edwin Pate, Dixie Guano Co., Laurinburg, N. C.; B. P. Redman, Jr., Farmers Fertilizer Company, Columbus, Ohio; Charles H. Riley, G.L.F. Soil Building Service, Ithaca, N. Y.; J. W. Rutland, Western Carolina Phosphate Co., Waynesville, N.C.; William C. Stark Atlantic Fertilizer Corp., Riverhead N. Y.; Thomas M. Ware, International Minerals and Chemical Corporation, Skokie, Ill.

That the American economy has weathered the recession, and new economic records are going to be made in the balance of 1961, was the point made by Dr. Rinfret in his talk on Monday, June 12. But beyond the immediate time, Dr. Rinfret discussed the longer-term outlook which he defined as the next five to ten years.

He listed six major changes in ground rules for economic growth, now taking place. These are transforming the nature of our economic system, he declared. The six changes are:

1. The age structure of the population is changing, with the younger age group growing by leaps and bounds.

2. Industry is changing its capital spending programs by putting an increasing part of its capital into research and development.

3. Industry is trying to reduce its capital investment in inventories.

4. The consumer is changing his tastes.

5. New industrial frontiers are emerging.

6. The international position of the U.S. has changed.

"We are in the midst of profound and far-reaching changes in our economic structure," he said. "This has had the effect of slowing down our economic growth and we will continue, at a slow rate for another few years." After 1965, however, Dr. Rinfret said that he expects the economy "to accelerate its growth curve."

"The anatomy of growth of American industries is changing," he continued. "The growth industries of the past 15 years will not be the growth industries of the next 10 years, industry growth rates are changing, new growth industries are emerging. The Americon economy is going through a change in its growth characteristics. The major growth industries of the decade of the sixties are likely to be electronics, office equipment, space and missiles, drugs, housing, water and sewerage and medical services.

"It is the very changing nature of the growth mix of American industry today that is a major factor in our lower rate of growth since 1955," he said. "From 1955 to 1965," Dr. Rinfret estimated that "our growth rate will average about 3% a year," adding that "after 1965 we will accelerate our growth rate as a result of the regrouping of growth forces currently underway.

"We have not lost our momentum," he said. "We are merely regrouping our forces for major technological breakthroughs in the latter part of this decade. We are on the verge of a technological explosion that will astound the world. The strength, resiliency and courage of the American economic system will continue to be a bulwark in the world fight for freedom."

Mr. Fifield told the NPFI group of many developments likely to come to pass in agriculture in the future.

Turn to CONVENTION page 41

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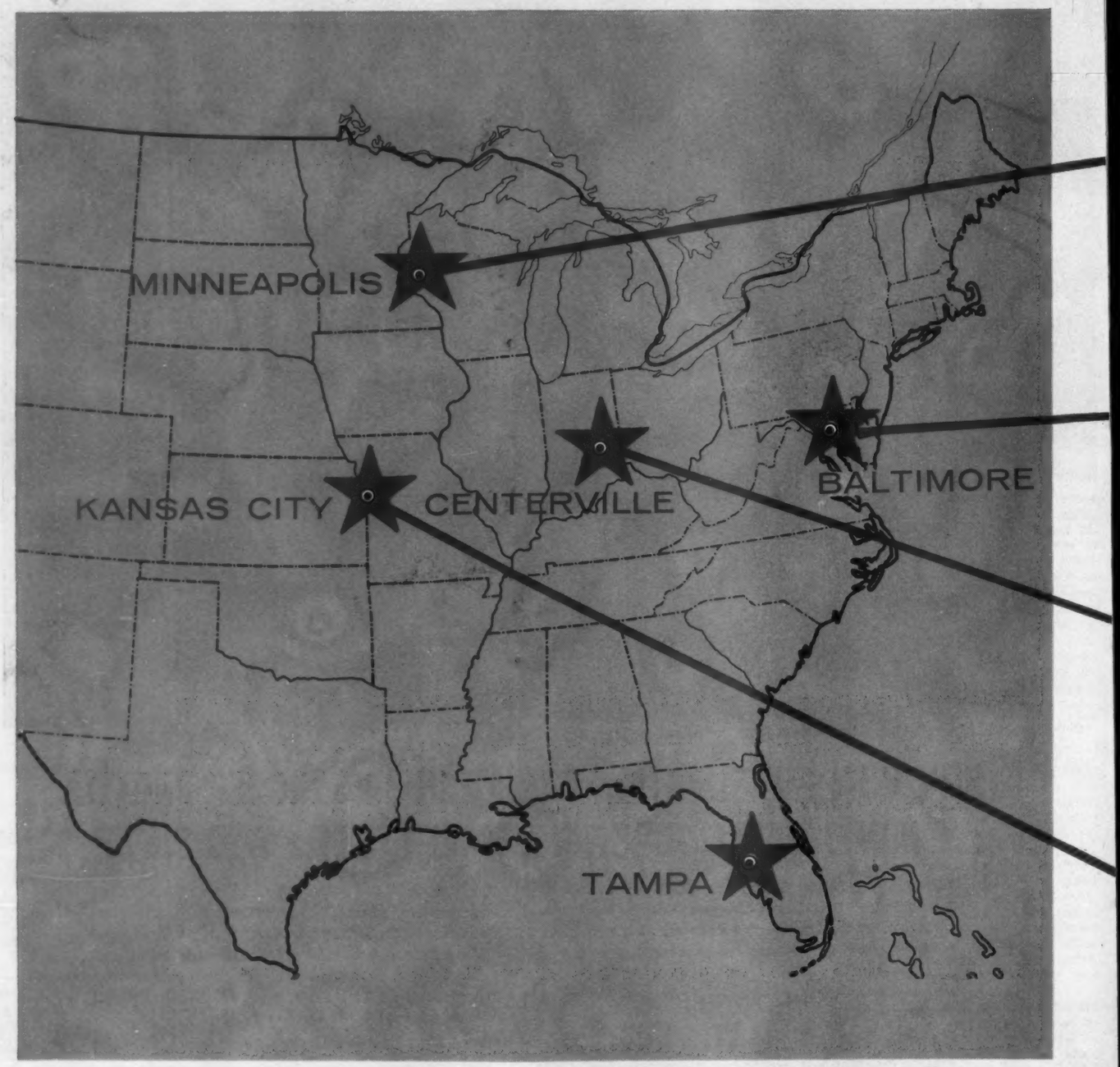

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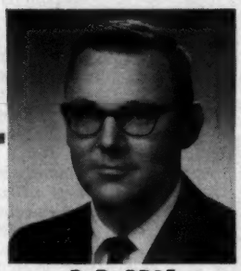

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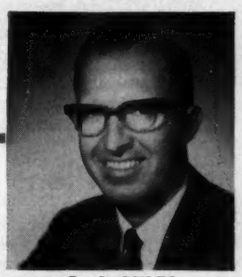

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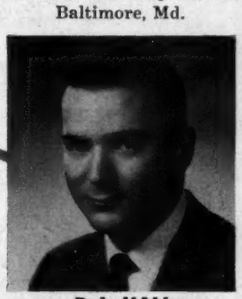

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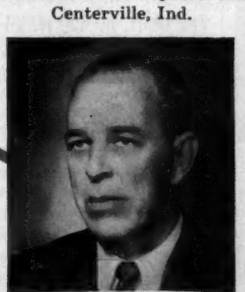

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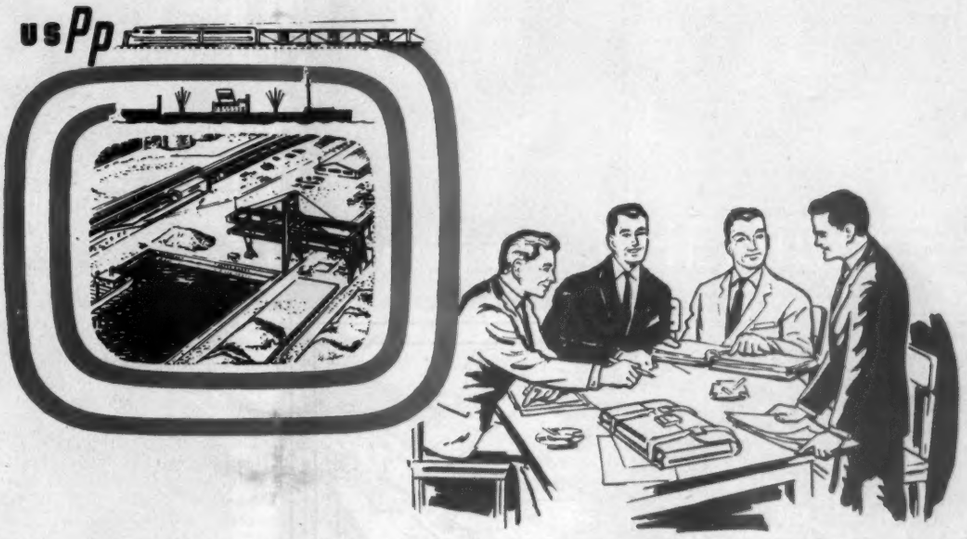

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Production MAN of the MONTH

Superintendent in Fertilizer-Making Trade for 34 Years

A PLANT superintendent who has "grown up" with the fertilizer industry is Howard Goller, whose responsibilities as "production boss" spread over six manufacturing plants of the Minnesota Farm Bureau Service Co. Mr. Goller, who dates his plant food career back to 1927, is located at the St. Paul plant, but has supervisory responsibilities over Farm Bureau plants at Moorhead, Benson, Dodge Center, Fairmont, and Clarkfield, Minn.

The St. Paul plant has a capacity of 20 tons an hour, or 60,000 tons mixed goods a year. The plant employs 25 men the year round, and at peak production periods, as many as 50.

Mr. Goller likes to relate the story about his start in the business. In the fall of 1927, he began working at the Bob White Mills in Duluth, Minn. as mill operator on the night crew. The next year the company entered the fertilizer business to become the state's first plant food manufacturer and the only plant west of Chicago at that time.

Early in 1932, Mr. Goller came to St. Paul to aid in installing fertilizer production machinery being installed by the Farm Bureau at that time. He has remained on the job ever since.

Many of the fertilizer manufacturing problems, solutions to which have long since been found, were new then and had to be figured out through trial and error. In commenting upon Mr. Goller's skill and determination in tackling the fertilizer manufacturing problems of that early day, a recent issue of the firm's house magazine said: "A lesser man than Goller . . . would throw up his hands and seek a job with fewer problems . . . but not Goller. If he felt dismay at any time, no one knew about it because his outward appearance was of a quiet, unruffled patience as he would lead his men to a fresh attack on the problems of making fertilizer ingredients behave in their complex mixtures and against the obstacles of physical makeup of elements, opposing weather, and moisture conditions.

Howard Goller

"But being a production boss isn't only ingredients, operation and manufacturing. It's leadership of men and making folks like to produce to the best of their ability and Goller knows how to do both of these jobs and do them well."

Mr. Goller has shown prowess in other areas, too. In the erection of plant buildings, he has demonstrated that he knows a great deal about construction. He can read blueprints and applies this knowledge in assuring the company of getting the most for its money when new plants are built. He has trained himself in this pursuit.

In fact, Mr. Goller has been alert to changes and advancements in the fertilizer industry for a long time, too. His "know-how" in fertilizer manufacturing has attracted other manufacturers to him for consultation and he is always willing to give of his time and knowledge. Mr. Goller is well aware that such information will result ultimately in the farmer getting the benefit of good plant food products.

Mr. Goller is married and has four daughters of whom he likes to talk. In addition, he has seven grandchildren of whom he is particularly proud.

PRODUCTION MAN'S "HOME"—This 60,000-ton capacity fertilizer manufacturing plant located on the Mississippi River at St. Paul is headquarters for Howard Goller. The plant, turning out granular mixed goods, has barge, truck, and rail facilities for incoming raw materials and for shipping of completed goods. Warehouse at right is 50 x 250 ft. and can hold 3,000 tons of bagged fertilizers.

Mississippi Fertilizer Group Plans Meet

BILOXI, MISS. — The Mississippi Soil Fertility and Plant Food Council will meet at the Buena Vista Hotel, Biloxi, Miss., Aug. 10-12, for its second annual convention, according to Mike R. Blouin, Jr., council president. Mr. Blouin said this year's program will deal with practical, everyday problems relating to the use of fertilizer on Mississippi's soils and for Mississippi crops.

The meeting will begin Thursday afternoon, Aug. 11, with presentations on soil testing, and cotton, corn, soybean, and pasture fertilization by members of the extension agronomy staff at Mississippi State University. Then, following a 4-H Method Demonstration on fertilizer, an open discussion is planned on the recently initiated Mississippi soil fertility program.

Dr. Frank J. Welch, assistant secretary of agriculture, will be the featured speaker on Friday morning. Appearing on the program with him will be A. P. Gates, vice president, Virginia - Carolina Chemical Corp., Richmond, Va., and R. E. Spivey, Jr., assistant to the president, Federal Intermediate Credit Bank, New Orleans.

A business meeting Saturday morning, including an election of officers, will complete the meeting.

New Warehouse

ONTARIO, CAL. — A new warehouse, latest completed construction for the Ortho Division, California Chemical Co., is now in operation at Ontario, Cal., the company says. The new facility will provide a larger and more central storage and supply location for Ortho fertilizers and pesticides needed in the Riverside-Ontario area.

The 60 ft. by 120 ft. structure contains 7,200 sq. ft. of storage space.

EDITORIAL AWARDS PRESENTED

WHITE SULPHUR SPRINGS, W. VA.—Dick Hanson, editor of "Successful Farming," Des Moines, and Ferdie J. Deering, editor of "The Farmer-Stockman," Oklahoma City, were presented awards by the National Plant Food Institute, for "superior journalistic contributions in the important field of building our nation's soils," during the recent NPFI meeting here.

Editors Hanson and Deering were winners in the Institute's annual nationwide "Soil Management Award for Editors" contest.

J. D. Stewart, Jr., Louisville, Ky., chairman of the board of directors of the Institute, presented the awards.

Judges for the contest were: Howard H. Campbell, president, National Association of County Agricultural Agents, Mineola, Long Island, N.Y.; Roger Fleming, secretary-treasurer, American Farm Bureau Federation, Washington, D.C.; Floyd D. Johnson, president, National Vocational Agricultural Teachers' Assn., Inc., York, S.C.; Herschel D. Newsom, master, the National Grange, Washington, D.C.; R. Lyle Webster, director of information, Office of Information, USDA, Washington, D.C., and Gordon K. Zimmerman, executive secretary, National Association of Soil Conservation Districts, Washington, D.C.

Scrolls signed by the national judges were awarded to Mr. Hanson, representing the winner among magazines of more than 300,000 circulation and to Mr. Deering, representing the winner among magazines of less than 300,000 circulation.

Features judged in the contest included stories, editorials, illustrations, and combinations of the three categories.

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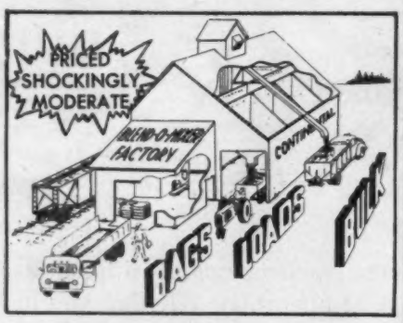

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Agronomic Briefs

From the Experiment Stations

More than 50,000 soil samples were tested by the University of Arkansas' Agricultural Experiment Station Soil Testing and Research Laboratories during the twelve-month period ending June 30, according to Dr. Lyell Thompson, associate agronomist in charge of the program.

This is the largest number of samples ever tested in one year by the laboratories and a more than 11,000 increase over the 1960 fiscal year. This is one of the largest increases over a previous year in the last decade. Figures for the last four years show 27,000 samples tested in 1958, 37,000 tested in 1959, and 39,000 in 1960.

The state laboratories provide free tests and fertility management recommendations to Arkansas farmers who request the service from their local county extension agents.

•

Corn Belt farmers who are high-level users of fertilizer make $25 more gross income per acre annually than do non-users, according to the Midwest division of the National Plant Food Institute.

An Institute-sponsored survey indicates a $67 per acre gross income for high-level plant food users, compared to $42 for non-users and the national average of $46 for all U.S. farmers. The survey covered a representative sampling nationally and regionally of farmers operating more than 100 acres each.

High-level fertilizer users are defined as "farmers who generally add plant food at rates close to levels recommended by state agricultural colleges."

The survey showed that 52% of the high-level users of fertilizer have a gross income of $10,000 or more.

•

Had it not been for chemicals, grasshoppers would have been a near first to drouth in ravaging millions of acres of crop lands in western Canada this year. Drouth continues to take its toll, but farmers spent more than $1,000,000 for grasshopper control chemicals and, while the job has not been completed, it has been effective. This is particularly true in southern Saskatchewan where the threatened infestation was most severe and where most of the chemicals were used. Roughly 200 of Saskatchewan's 300 municipalities and comprising some 15,000,000 acres were in the grasshopper infested areas. About 7,000,000 acres in Alberta reported light to heavy infestations, while in Manitoba some 3,000,000 acres were infested.

Experts warn, however, that there are still enough grasshoppers in all three provinces to pose a serious threat for next year if dry weather continues.

•

"Weeds won't muscle in on alfalfa stands if fields are top-dressed regularly with phosphate and potash fertilizer," the Midwest division of the National Plant Food Institute, tells farmers. They quote University of Missouri soils scientists who point out that alfalfa uses up more phosphate and potash than any other crop.

"A four-ton per acre alfalfa yield removes 48 lb. of available phosphate and 180 lb. of available potash from the soil," the specialists report.

"Even though adequate amounts are applied before seeding, these nutrients will be used up quickly. And when the supply of any one of these nutrients runs short, the alfalfa plants weaken and die out. Weeds and grasses start taking over and soon the stand is ready to be plowed up."

Top-dressings should be made as soon as possible after the first cutting of hay, starting the first year after the alfalfa field is seeded.

The Missouri soil specialists say that in many cases farmers may find it profitable to top-dress phosphate-fertilizer at the rate of 600 lb. an acre of 0-20-20 or its equivalent.

•

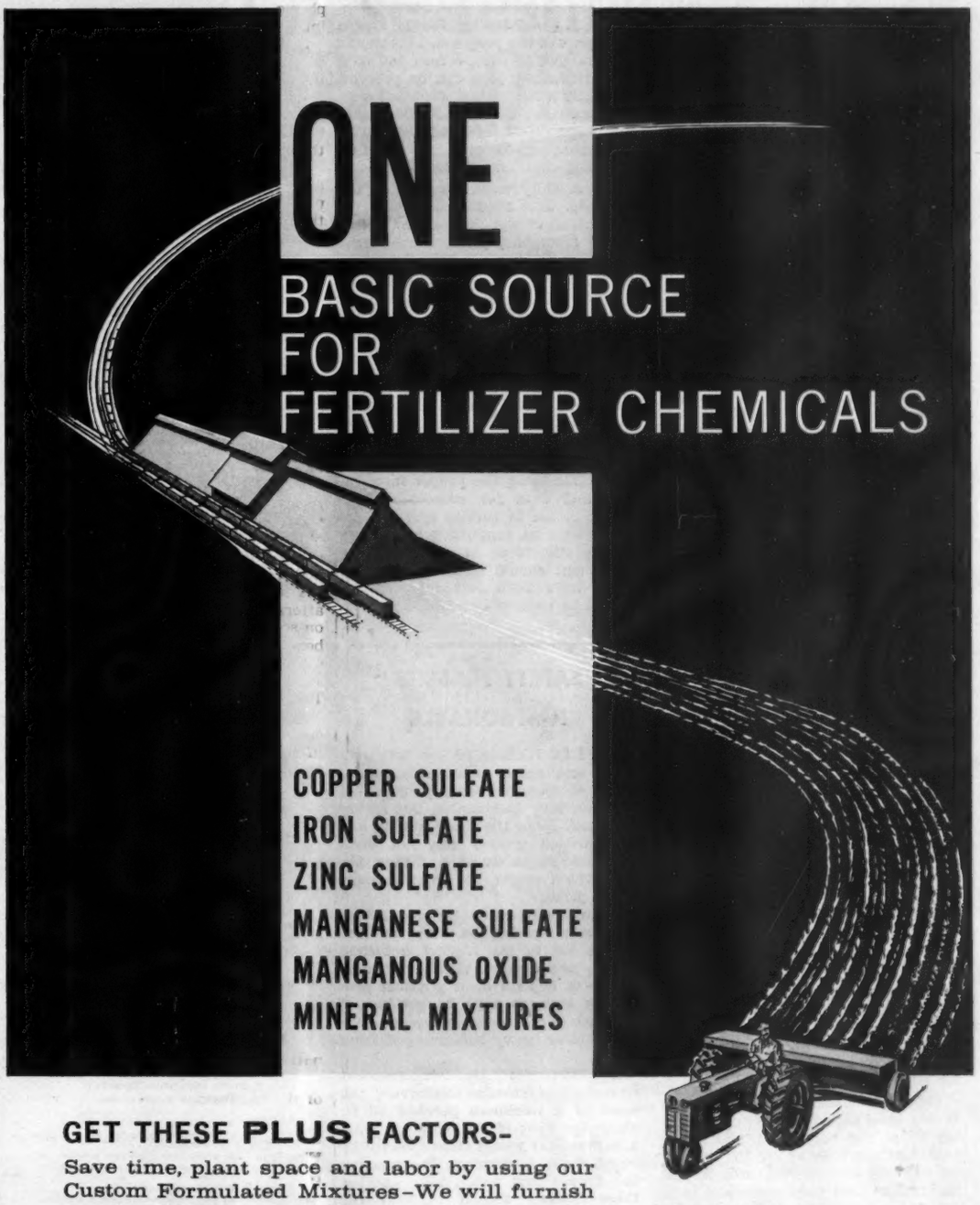
That nearly all Iowa farmers use chemicals in their farming operations has been established by a recent survey among 315 farmers in that state, by Drs. Joe Bohlen and George Beal, Iowa State University. Their findings show that nine out of ten farmers are using at least one agricultural chemical. A third of those interviewed said they were using only one of these six kinds of chemicals: weed killers, soil insecticides, brush killers, crop insecticides, grass killers, and grain fumigants. About 25% of the farmers using chemicals used them only on fencerows, ditches, and roadsides. Others used them only on a "spot", or limited basis on field crops. Cost of chemicals among the farmers interviewed ranged from zero to $625 a year, averaging $47.02 a year.

Systemic Insecticides Subject of Conference

STATE COLLEGE, MISS.—More than 100 entomologists and others from all parts of the U.S., and also from Canada, attended a recent two-day work conference on systemic insecticides for controlling insect pests and parasites of livestock. The conference reviewed results of research and field trials with currently recommended and experimental systemic insecticides.

The meeting was sponsored by the entomology research division, USDA, and the section on medical and veterinary entomology, Entomological Society of America. Host was the department of entomology, Mississippi State University.

The visitors were welcomed by D. W. Colvard, president of Mississippi State University.



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Maintenance in Plant Requires System and Will to Make it Work

A DAB OF OIL here—a twist of a wrench there—an occasional tightening of a belt—adjustment of tension now and then; is this what could be called a maintenance program? If so, it is of the wrong sort.

The above acts are haphazard, whereas good maintenance is never haphazard. It is planned and carefully programmed in even the smallest plant. Without such planning and programming, equipment life is wasted, operating dollars are allowed to be frittered away and costs rise in every part of the plant.

Maintenance planning should be set up and regulated to fit the equipment and schedules of use in each plant individually.

There is a basic plan around which such a maintenance program should be built. With this outline, presented in the following paragraphs, any plant superintendent can set up such a program of his own:

(1) Determining who will be responsible for application of the program after it has been drawn up. Without fixed and definite responsibility on one individual in the organization the program itself will falter, no matter how good the plan.

In turn, there must be a definite degree of responsibility assigned to every man on the staff who uses any equipment in the plant. Each should understand the maintenance plan and particularly his own part in carrying it out.

(2) Financial support of the plan is vital. The program should always take into account this phase of maintenance. And the allocations should be flexible enough to take care of unusual circumstances.

Approval of the front office may well be required, under the program, where estimated cost of labor and materials exceeds a certain amount (perhaps $25) and thus a degree of control retained over the costs of the program. Petty cash expenditures can best be left to people in the plant concerned with maintenance in order to avoid excessive record-keeping chores on the part of those in charge of the maintenance program.

It is always difficult to set up a fixed sum for maintenance since breakdowns, unforeseen factors may accelerate wear and tear on equipment. The budget set up by management should, therefore, have a degree of flexibility which will allow for such events.

(3) Maintenance records are vital to any good program. They should be set up at the very start and maintained as carefully as are the records on receipts and expenditures in the main office. One good procedure is to set up an individual card record for each piece of major equipment. This card should detail the maintenance history of that piece of equipment. Usually such records are kept in the office of the individual in charge of the maintenance program and are kept by him.

(4) Work schedules for periods directly ahead should be part of the program. These should be made up on three classes of work: (a) Jobs which can be definitely planned ahead; (b) jobs which may vary with conditions but nevertheless must be fitted in at approximate times, and (c) jobs which must be done as emergencies arise. Flexibility in the master schedule is needed to handle the latter type of maintenance jobs.

(5) A good tickler file is also a vital part of the program. This should be arranged so work orders and data on forthcoming jobs can be presented. Such a file should show all such maintenance jobs that have been definitely scheduled for fixed dates with accompanying "check" spaces for initialing that the job has been done.

(6) A daily work program in the schedule. This should be made from the outline of work ahead and fitting in any emergency jobs.

(7) Maintenance materials requirements should also be calculated, when this procedure makes possible closer control on cost of maintenance. It also assures that funds will be available for such maintenance work as it arises and that nothing need be "put off." This latter procedure is one of the major sins of maintenance. Each time needed maintenance is postponed, the life of that particular piece of equipment is shortened.

(8) Obtaining the proper information and data for correct maintenance. A file of service and maintenance data as supplied originally by the manufacturer of each piece of equipment should be set up. Where these have been lost replacements should be secured immediately to reduce possible mistakes in maintenance.

Such a file should also contain lubrication charts and other maintenance data from every possible source.

(9) Any good maintenance program allows for periodic training and instruction. Over-all maintenance is always more easily accomplished when everyone on the job in maintenance conscious.

(10) Time charts should be set up for each piece of equipment. These should assure management that each unit receives proper maintenance attention as frequently as needed. Such charts also have a big advantage in permitting scheduling of individual maintenance jobs with each other so that maintenance work may be evenly spaced and mechanical breakdowns reduced to a minimum, particularly during the busy season where loss of production takes on serious proportions.

A model method of record-keeping for fertilizer plant machinery maintenance has been devised by International Minerals & Chemical Corp., Skokie, Ill., as part of its "Full Orbit" program for plant food manufacturers.

A check list issued by IMC for this purpose is reproduced here, as a refresher for plant personnel in scheduling maintenance operations.

SAFETY HELMETS FASHIONABLE

SAFETY HELMETS are becoming more and more fashionable in all types of manufacturing plants. Not only are they fashionable, but highly practical. Even the most nimble and quick-witted worker can not duck fast enough to avoid a falling object which might do great damage to his head.

A mathematically-inclined fellow did some figuring on time involved to get out of the way of a falling object, and decided that it is much better to depend upon physical protection than to hope to get out of the path of a descending wrench, pulley, pole or heavy bolt dropped from above.

To illustrate: A 12-oz. crescent wrench accidentally slips from the hand of a workman perched 65 ft. above the floor of the plant. At least a half second would elapse before he could shout a warning. The man on the floor below would take another three quarter second to hear the warning and react to it. But even then, he would not know which way to dodge until he looked up, which might take another half second. By this time, before he had decided what to do about the situation, the wrench would be just four feet above his head and descending at the rate of about 40 miles an hour. It is at this point that a safety helmet comes in very handy.

PREVENTIVE MAINTENANCE

CHECK LIST

DATE CHECKED_____

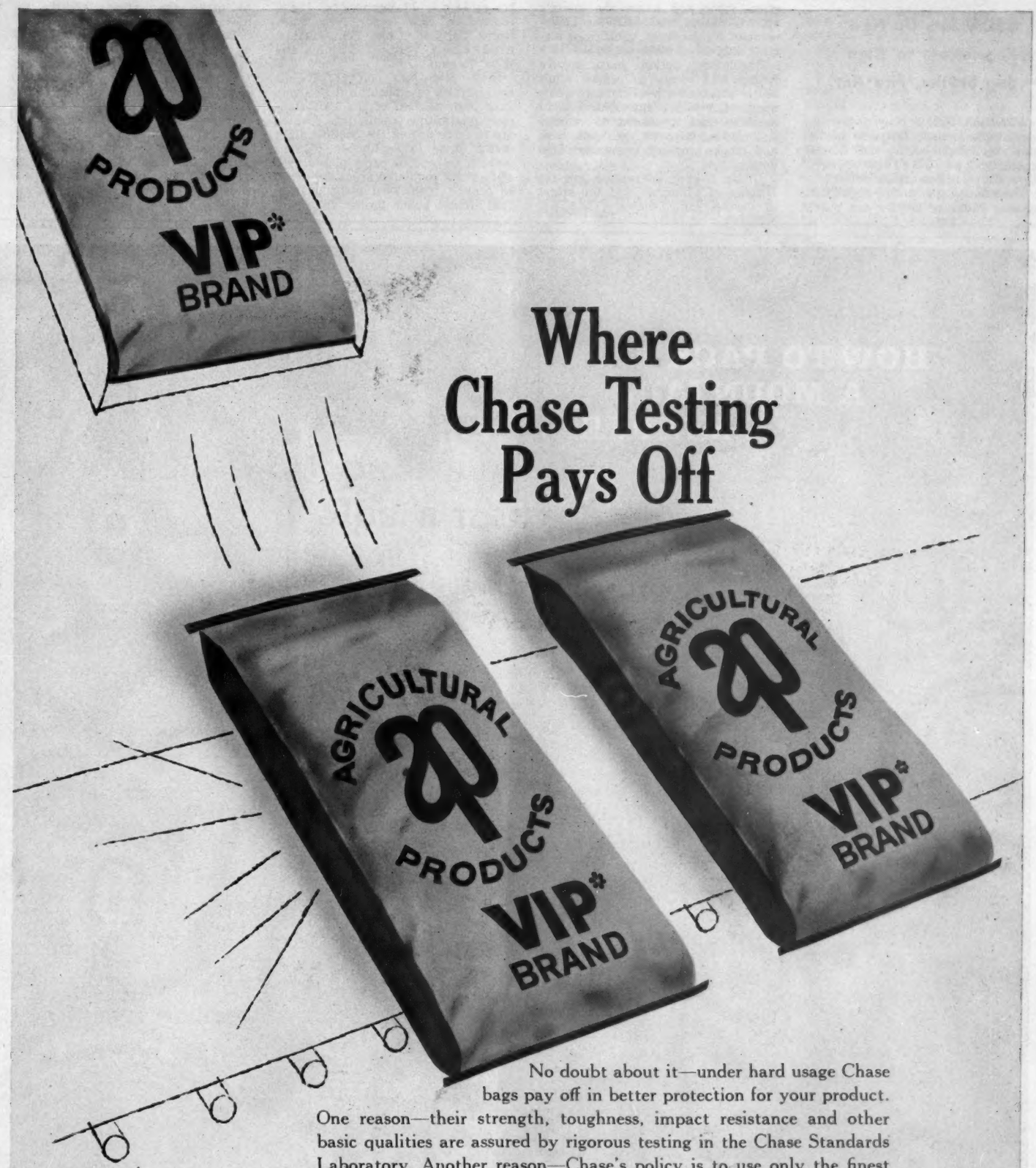
BY WHOM _____

SEE REVERSE FOR MAINTENANCE NEEDED - SUGGESTED MAINTENANCE FOR THIS SECTION OK_____

OK	NOT OK	
		A. MATERIAL HANDLING EQUIPMENT
		1. PAYLOADERS
☐	☐	a. brakes and brake fluid.
☐	☐	b. clutch.
☐	☐	c. hydraulic cylinder and hydraulic fluid.
☐	☐	d. electrical system.
☐	☐	e. cooling system.
☐	☐	f. oil filter.
☐	☐	g. steering mechanism.
☐	☐	h. gauges.
☐	☐	i. tires.
☐	☐	j. _____
		2. BUCKET ELEVATORS
☐	☐	a. condition of buckets and bolts.
☐	☐	b. links.
☐	☐	c. tightness and condition of chain.
☐	☐	d. speed.
☐	☐	e. head and boot sprockets.
☐	☐	f. casing.
☐	☐	g. boot shaft and bearings.
☐	☐	h. head shaft, sprocket and bearings.
☐	☐	i. motor and drive.
☐	☐	j. discharge spout and flop gates, if installed.
☐	☐	k. access ladders, if used.
☐	☐	l. paint condition.
☐	☐	m. _____
		3. CONVEYORS
☐	☐	a. check all belts for wear on edges or tears.
☐	☐	b. check for deep scores or undue wear.
☐	☐	c. alignment of head and boot pulley for proper tracking of belt.
☐	☐	d. shafts and bearings.
☐	☐	e. properly positioned and free turning idlers.
☐	☐	f. condition of support or structural members.
☐	☐	g. motor and drive.
☐	☐	h. _____
		4. SCREW CONVEYORS
☐	☐	a. general condition of housing.
☐	☐	b. alignment of screw—no binding.
☐	☐	c. general condition of bearings.
☐	☐	d. motor and drive.
☐	☐	e. _____
		5. CHUTES
☐	☐	a. properly supported.
☐	☐	b. no leaks.
☐	☐	c. paint condition.
☐	☐	d. check for corrosion.
☐	☐	e. _____
		B. WEIGHING EQUIPMENT
		1. FLOOR SCALE
☐	☐	a. clean, dry sump.
☐	☐	b. recently checked and calibrated.
☐	☐	c. _____
OK	NOT OK	**D. MIXING EQUIPMENT**
		1. ROTARY MIXERS
☐	☐	a. general condition of shell.
☐	☐	b. condition of tires and trunions.
☐	☐	c. condition of ring gear and pinions or chain and sprockets.
☐	☐	d. proper mesh of gear tooth surfaces.
☐	☐	e. tightness and condition of intake and discharge doors on batch mixers.
☐	☐	f. check sparger support members for corrosion or weakening.
☐	☐	g. general condition of intake and discharge chutes, (leakage, vibration, corrosion, etc.).
☐	☐	h. motor and drive.
☐	☐	i. proper safeguards.
☐	☐	j. condition of fume stack.
☐	☐	k. _____
		2. PUG MILL
☐	☐	a. general condition of housing, cover, and dropout doors.
☐	☐	b. condition of paddles.
☐	☐	c. shaft and bearings.
☐	☐	d. motor and drive.
☐	☐	e. condition of fume stack.
☐	☐	f. condition of intake and discharge chute.
☐	☐	g. check sparger entry point for corrosion and weakening.
☐	☐	h. _____
		E. DRYING AND COOLING EQUIPMENT
		1. DRYER AND COOLER DRUMS
☐	☐	a. condition of tires and trunions.
☐	☐	b. anchor bolts on trunion pillow blocks.
☐	☐	c. condition of ring gear and pinions or chain and sprockets.
☐	☐	d. proper mesh of gear tooth surfaces.
☐	☐	e. condition and proper operation of thrust bearings.
☐	☐	f. proper safeguards.
☐	☐	g. condition of shell and general alignment of drum.
☐	☐	h. condition of flight and material pattern.
☐	☐	i. condition of intake and discharge breeching.
☐	☐	j. _____

OK	NOT OK	
		2. BATCHING HOPPERS
☐	☐	a. general condition of hopper (corrosion and paint).
☐	☐	b. shut-off gates; no undue wear, close properly.
☐	☐	c. control levers operating properly.
☐	☐	d. _____
		3. SCALE HOPPER
☐	☐	a. general condition of hopper (corrosion and paint).
☐	☐	b. shut-off gate; no undue wear, closes properly.
☐	☐	c. scale checked and calibrated.
☐	☐	d. control lever operating properly.
☐	☐	e. _____
		4. AUTOMATIC WEIGH FEEDERS
☐	☐	a. general condition and location.
☐	☐	b. calibration.
☐	☐	c. cleanliness.
☐	☐	d. _____
		5. TRUCK SCALES
☐	☐	a. clean, dry sump.
☐	☐	b. recently checked and calibrated.
☐	☐	c. clear approach to scale.
☐	☐	d. _____
		C. SCREENING AND CRUSHING EQUIPMENT
		1. SCREENS
☐	☐	a. clean, repair, and/or replace screens.
☐	☐	b. condition of vibrating motor or drive mechanism.
☐	☐	c. condition of attached chutes and hoppers.
☐	☐	d. adequate screen inventory.
☐	☐	e. _____
		2. CRUSHING MILLS
☐	☐	a. condition of housing, (corrosion, leaks, paint).
☐	☐	b. bearings and shaft.
☐	☐	c. condition of hammers, chains, cage, etc.
☐	☐	d. motor and drive.
☐	☐	e. inventory of chains, swing hammers, etc.
☐	☐	f. _____
OK	NOT OK	
		2. COMBUSTION CHAMBER
☐	☐	a. condition of combustion chamber lining.
☐	☐	b. proper operation and burner controls.
☐	☐	c. clean burner tips.
☐	☐	d. _____
		F. DUST COLLECTION
		1. CYCLONES
☐	☐	a. clean and check general condition.
☐	☐	b. check for air leaks at suction and discharge.
☐	☐	c. proper operation of dust discharge valve.
☐	☐	d. condition of supporting members.
☐	☐	e. _____
		2. FANS
☐	☐	a. check general condition of housing.
☐	☐	b. check blades for balance and undue corrosion and erosion.
☐	☐	c. condition of bearings and shaft.
☐	☐	d. condition and tension of fan belts.
☐	☐	e. motor and drive.
☐	☐	f. inspect intake and discharge ducts for fouling and corrosion.
☐	☐	g. _____
		G. BAGGING AND SHIPPING (Check Elevator, Screens, Crusher, and Conveyors of Shipping Mill per previous instructions).
		1. BAGGING EQUIPMENT AND SEWING HEAD
☐	☐	a. clean all equipment and check for worn or corroded parts.
☐	☐	b. availability of instruction manuals and proper parts inventory (follow manufacturer's maintenance suggestions for specified equipment).
☐	☐	c. weight accuracy.
☐	☐	d. _____
		2. BAG HANDLING EQUIPMENT
☐	☐	a. condition of automatic conveyors and roller conveyors.
☐	☐	b. check dolleys and all equipment for sharp corners.
☐	☐	c. condition of pallets and number.
☐	☐	d. _____

IV. MANUFACTURING EQUIPMENT DETAILS ON CHECKED NUMBERS



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USDA Sets Up New Regulations to Curb Jap Beetles, Fire Ant

WASHINGTON — New quarantine regulations against Japanese beetles have been applied in the eastern states by the U.S. Department of Agriculture, it has announced.

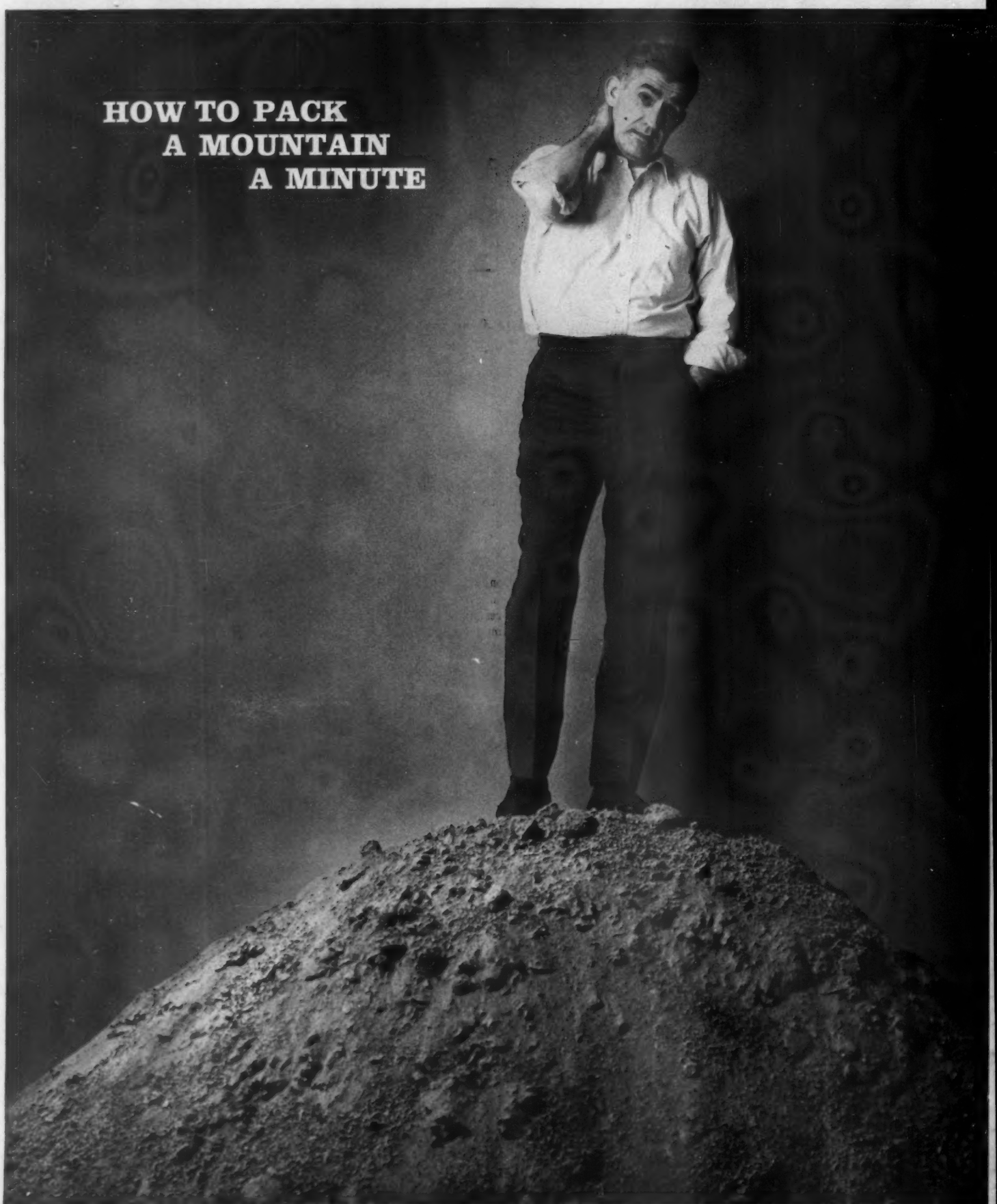
The summer quarantine regulations against Japanese beetles are put in effect when and where the insect's activity makes hazardous the movement of commodities, vehicles or aircraft into beetle-free areas.

Regulatory action may involve foliage treatments to reduce adult beetle population, inspection or treatment of infested agricultural commodities, and treatment of vehicles — including aircraft, railroad cars, and trucks—moving to nonregulated destinations.

Under federal quarantine are the District of Columbia and the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia.

State plant-pest control officials and carriers of agricultural products have been notified of the 1961 summer quarantine regulations, which are in force during the beetles' flight season, June to September. Persons wishing to send or carry plants with soil outside regulated areas are urged to consult their local plant quarantine official about proper treatment to make the articles eligible for movement.

Last summer, heavy concentrations of Japanese beetles at several eastern airports required emergency treatments of surrounding fields and —at a few airports—of the planes themselves. Since then, semi-permanent soil treatments have been made at a number of airports doing interstate business to reduce grub populations at these favorite breeding grounds, thus further limiting the possibility of spread through aircraft. Federal and state inspectors will con-



tinue close inspection of planes arriving in beetle-free areas from infested states.

Spotty infestations of the beetle exist in the eastern U.S. as far west as the Mississippi River borders of Missouri and Iowa and as far south as Georgia. The insect was found at Sacramento, Cal., June 7, and eradication efforts are now under way.

USDA has also announced the removal of Nassau County and parts of Hillsborough and Pasco Counties, Florida, from the areas regulated because of the imported fire ant. The change became effective June 30.

At the same time, USDA added as regulated areas, Coose County, Ala.; Liberty and Montgomery Counties, Texas, and parts of 31 other newly-infested counties and parishes in Alabama, Florida, Georgia, Louisiana and Mississippi.

In previously-infested areas of Alabama, Florida, Georgia, Louisiana and Mississippi, regulated areas are being extended in 34 counties and parishes. Regulated areas in Arkansas and South Carolina remain unchanged.

Lewis Johnson, Tri-State Fertilizer Officer, Dies

BURLINGTON, IOWA — Lewis Johnson, secretary-treasurer of Tri-State Fertilizer Co., Burlington, was fatally injured in an auto accident near Holdrege, Neb., June 29. His wife and children were injured in the accident and were expected to remain in Presbyterian Hospital, Denver, Colo., until past the middle of July. Funeral services for Mr. Johnson were held at Brush, Colo., where interment was made.

Mr. Johnson had been associated with the Tri-State firm since its founding some 5 years ago. He had been prominent in agricultural activities in southeastern, Iowa, and had worked closely with the National Plant Food Institute and other agencies in the Intensified Soil Fertility program in Des Moines County, of which Burlington is the county seat.

Other officers of the Tri-State firm are A. G. Stevenson, vice president, and John H. Witte, president.

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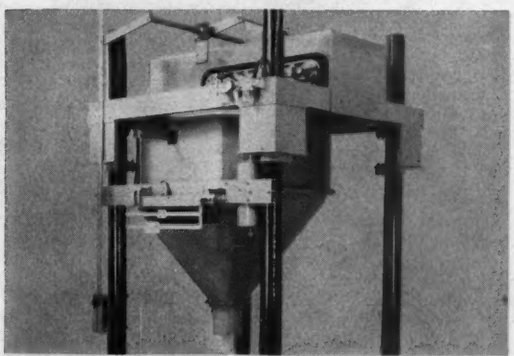

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Increasing Role Seen for Fertilizers and Pesticides in Agriculture of Future Years

By Willard M. Fifield*
Provost for Agriculture
University of Florida
Gainesville, Fla.

Future agricultural changes, though profound, will come about gradually, Florida educator predicts . . . fertilizer and pesticides to play a larger role in farm production . . . farm profits to increase . . . but farmer to receive smaller proportion of consumers' dollar . . . yields of many crops to keep on increasing . . . agricultural workers to number about 4 million by 1985 . . . with farm units reduced to some 900,000

PREDICTING future developments in farming lends itself more to plotting trends rather than stating precisely what will take place in the next five or ten years. Educators are expected to look forward, to utilize their collective intelligence to anticipate conditions to come in future years, and to prepare graduates for future leadership.

Thus, to form a base for remarks on what may be expected in agriculture during the next 25 years, members of the agricultural faculty at the University of Florida were asked for their views on the subject. In doing so, their answers were largely oriented to the area of scientific and technological development, as might be expected. It is difficult to develop a precise time-table for specific future practices, but there are numerous trends in evidence that may be discussed.

Tractors have largely replaced horse and mule power on American farms, but who can say exactly what year this transition was made? In 1950, there were 3.5 million farm tractors in the U.S. By 1959 these had increased to 4.8 million. Evaporated milk was invented in 1856, but nowhere can one find the date on which this product first became a significant factor in the dairy business. A new mousetrap could be invented today and be in widespread use within a year, but this isn't quite the case with many agricultural developments. Even though new and better equipment becomes available, farmers cannot usually afford immediately to replace serviceable items already on hand.

We should perhaps be thankful that this is true. It provides a breathing spell for adjustments. It is terrifying enough to hear about things which probably will exist 25 years from now, especially if substantial capital may be risked in an enterprise that could become out-dated before the investment is realized.

Here are some predictions as we look ahead:

The core of agriculture in future years will be management. Management is the whole process of adjusting to change through decision making, action and follow-up. Management is therefore not possible unless there are sources of knowledge and means of control. The developments projected below clearly show that there will be great gains in knowledge and means of control.

Consider for example what improved means of measurement will mean for control. Through breeding and the use of genetic, chemical and physiological markers, rates of growth of both animals and plants will be measured quite accurately. The finished products will therefore be more uniform in quality, and the quantity will be more controllable. Through better means of measurement, we will be better able to determine how much of each commodity we will need and what resources will be required to attain the goals, and we will be able to follow the progress of growth to see whether the goals are being met. If not, the growth and yield processes will be either accelerated or retarded as the case may be. The use of resources will be better arranged and more efficient. For example, land-use planning and resulting zoning laws will help determine where crops will be grown.

It appears there will be more centralized control and direction. Much of this will be done by government. But much of it can also be done by producing and marketing groups if they are vigorous and farsighted. For example, zoning and public health regulations will fall under the purview of government; the establishing of production goals and efforts to fulfill those goals and many efforts for regulating and promoting orderly marketing can come under the province of producing and marketing groups.

Insofar as non-governmental groups fail in those efforts, government will enter the picture. The real problem may be how to maintain a satisfactory degree of freedom and democratic control as more and more power is given to government to "promote the general welfare." We may expect some form of farm program to be continued, including payments possibly above market price levels on a commodity basis. Politics will continue to dilute sound economics.

Farms to Expand

With the rapid economic growth in the U.S., agriculture will become less important dollar-wise in relation to the whole economy. As average incomes increase, great pressure will exist for higher individual farm net income. Farmers will expand the total size of their businesses greatly to expand income.

The necessity of this expansion together with the revolutionary discoveries and inventions will greatly increase the need for capital both for long-term investments and operating expenses. Management and marketing will become much more important as size of businesses increase. Farmers will specialize in one or two enterprises not only because this is the easiest from the management standpoint but also because it will be possible to grow the same crop on the same land year in and year out. Much of the equipment will be semi-permanent on the land to apply the necessary chemicals and pest controls to get larger yields no matter what the natural fertility of the soil. Basic climatic conditions will determine what crops can be grown.

Even though there will be great pressure to enlarge the size of farming operations and all farms will be larger by today's standards, farms will tend to fall into two broad categories:

(1) The very large farms with huge capital investments and automation and

(2) Relatively smaller farms with highly skilled managers and much lower capital investments. The relatively smaller farms will be more efficient than the large farms, but their net income will be less. Smaller farms will use more custom work, such as spraying, fertilizing, planting and harvesting.

Fewer Farm Units

According to the now accepted definition of a commercial farm, in 1960 there were 1.7 million commercial farms in the U.S. Within 25 years the number will be reduced by 50%, or about 900,000 commercial farms.

The agricultural labor force now numbers 7 to 8 million, a decrease of 50% in the last 40 years. This number will be reduced to about 4 million by 1985. However, the production per man-hour will increase at least another 200%, which equals its increase in the last 40 years.

By 1985 farmers will be better organized as a group (through both cooperative and political action). Farmers will plan their operations with computing equipment for determining production goals, what factors to use and how much, shortages, best crops for specific seasons, best marketing methods, and most any phase of production and marketing one can think of. There will be commodity committees to plan production and marketing. Production and marketing will be integrated so that production will be kept in better balance with effective demand. Hence, many of the management decisions will be made by integrators or industry commodity committees.

Profits from farming will increase because of increased efficiency and less competition. The high initial cost of starting a farming operation will reduce competition. Farms will be so large that an individual will not be able to own a farm in his lifetime. Hence, different methods of credit and finance will be developed for keeping farms in operation from one generation to the next. Some form of incorporation will evolve.

In 1960, consumers spent about $100 billion for food and fiber. Farmers received only 30% of this. It is expected by 1985 farmers will receive an even smaller proportion of the consumers' dollar. This, of course, will be due to the many added services which will accompany the food package. Dehydration, freezing, precooking and a host of things will be added so that all a housewife will have to know to be a successful cook is how to count, tell time, and read. Few girls will win husbands by their culinary art.

The increased cost of marketing will bring pressure for cost-reducing research in that area. Likewise the continued cost-price squeeze on farmers will bring pressure for cost-reducing research in production. Giant strides will be made in each area. As the researcher gains knowledge and experience, research will be more effective because efforts will be directed toward those things which offer the greatest potential.

Agronomists predict that the plant breeder will have available banks of genes for some of the more popular species. These genes can be incorporated into established varieties by using a virus that acts as a carrier similar to the transforming principle in bacteria.

Mutation breeding will be much less of a hit or miss proposition. Directed mutation will be fairly common through incorporation of factors similar to controlling elements that exist in corn today.

More emphasis will be placed on breeding crop varieties for mechanization; for example, a small corn plant with ears in the tassel only.

Most farm land will be leveled

*Adapted from talk presented before National Plant Food Institute annual convention, Greenbrier Hotel, White Sulphur Springs, W. Va., June 13, 1961.

to facilitate movement of machinery. The effect of leveling on productivity of soils will hardly be noticed because soils will be given uniform, desirable physical, chemical and biological properties by treating with long lasting soil additives. Soils will be custom rebuilt with the desired properties needed on the individual farm.

Fertilizer materials will release their nutrients readily to plants but slowly or not at all to leaching and other forms of present nutrient loss.

Nearly all cultivated lands and pastures will be irrigated.

Water from the sea, and brackish water will be used in agricultural production.

Mixed fertilizers will be pelletized and the use of synthetic organics with controlled availability will be common. Liquid fertilizers will be applied with irrigation water.

Use of limestone in field crop production will have quadrupled.

Yields of many field crops may be two to four times present yields per acre. Better farmers everywhere will be making 200-300 bu. of corn, 6,000 to 8,000 lb. peanuts, 60-80 bu. soybeans and 15 to 20 tons of hay to the acre. Yields such as these today are not exactly phenomenal, but just remember—they are a long way from today's average yields. Today in Florida yields of flue-cured tobacco average 1,500 lb. Within 25 years, we expect them to yield from 2,400 to 2,700 lb. per acre of excellent quality, cured leaf.

It is possible even now under certain stimuli to produce many types of plants, particularly some cut flowers, ornamentals and row crops in a "plant factory." This operation could be almost entirely automatic and remote controlled. Environment would be controlled, solution culture used and systemic pesticides employed. No farm land as such would be utilized. Certainly we know that more horticultural crops will be grown more intensively than they are today.

There will also be tremendous de-

Turn to **PREDICTIONS** page 40

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Patterns in Use of Phosphate for Manufacture of Mixed Fertilizers

By Dr. R. P. Thomas
International Minerals & Chemical Corp.
Skokie, Ill.

PHOSPHORUS was one of the first nutrients applied to soil as a fertilizer. Early phosphorus materials were largely by-products, such as bones. Fortunately, however, the fertilizer industry learned early the technique of treating phosphate rock with acid to produce a more soluble phosphorus fertilizer. This early soluble phosphate was first called "acid phosphate." Now this same product goes under the name of superphosphate.

Continued development of this acidulation process produced a concentrated superphosphate now designated as "triple superphosphate." Recently economical processes were developed for the making of liquid P_2O_5 carriers to use in fertilizers. Its use has expanded so now it provides a concentrated source of liquid P_2O_5 and a way to use cheaper nitrogen carriers. The use of liquid P_2O_5 has even been expanded into the production of solid ammonium phosphate materials. All of these different phosphate carriers are now used in the fertilizer industry.

At one point in fertilizer production, normal superphosphate supplied 90% or more of the P_2O_5 used in the fertilizer. Within the last 20 years a substantial tonnage of normal superphosphate has been replaced by triple superphosphate. Now many producers are using combinations of normal superphosphate and phosphoric acid as the source of P_2O_5 in mixed fertilizer. These combinations permit the use of much more of the cheap normal superphosphate. Thus, use of more normal super along with liquid phosphoric acid, instead of triple superphosphate, has resulted in concentrated fertilizers at a cheaper production cost. Such fertilizers contain the needed amounts of calcium and sulfur for a good fertilizer mixture.

Our better understanding of the reaction between phosphate fertilizers and soils has aided in production and use of phosphate fertilizer. For many soils, normal superphosphate is the most desirable phosphate carrier. This is especially true for acid soils. In strong alkaline soil the more soluble carriers, such as ammonium phosphate and phosphoric acid, may be the desired source of phosphate. Regardless of the form of the phosphates applied to a soil, they usually change quickly in the soil to a less soluble form.

This phosphorus transformation in a soil depends on a number of factors. The rate of application of phosphorus, the manner of applying the fertilizer to a soil and solubility of the phosphate in the fertilizer influence the reaction in the soil. The more soluble the phosphate, the greater is the speed of this change and the more complete is the reaction. The particle size of the phosphate carrier will influence the speed of the reaction. Specific soil conditions, such as pH, base saturation, mineral content, organic matter, types of clays, etc., will affect these phosphate and soil reactions.

In acid soils, the soluble phosphates react with the slowly soluble iron and aluminum compounds to form various iron and aluminum phosphates. These new phosphate compounds may be amorphous (non-crystalline) to distinct crystalline in structure. Such new compounds have various degrees of solubility or availability. As soils decrease in acidity, more bases, such as calcium, and magnesium, are present. These bases form various crystalline phosphate compounds which are less soluble than the applied phosphate. In most alkaline soils much of the soluble phosphate changes rapidly to comparatively insoluble calcium and magnesium phosphates. Soil conditions will greatly affect the continued availability of phosphates applied in fertilizer, even after the first transformation in the soil.

Much work has been carried on to reduce these undesirable changes in the soil following phosphate fertilizer applications. The methods of solving this problem have centered on ways of reducing the contact between the phosphate particles and the soil. Granulation of the fertilizer particles has aided in preventing some of these contacts. Concentrations of the fertilizer into bands near the roots or seed has helped keep the applied phosphate soluble. The most recent methods used to depress these insoluble reactions are various coatings. The fertilizer particles were coated with materials such as plastics, grease, graphite, etc.

Some of the disappointment in these studies was the lack of stability of the coatings and the extra cost. Since phosphate fertilizers are still relatively inexpensive, many believe it is just as desirable and economical to use excesses of P_2O_5 in order to maintain a desired phosphate availability in place of reducing the contact between the applied phosphates and soil particles.

The tracer element technique or tagged phosphoric test indicates that a plant feeds heavily on an applied phosphate fertilizer early in its life. As the plant reaches maturity the amount of phosphorus absorbed from the applied fertilizer phosphorus decreases rapidly. At maturity most crops have absorbed only between 15 to 50% of their phosphorus uptake from the applied fertilizer phosphorus. In general, the proportion of phosphorus coming from the applied fertilizer phosphate is about the same in most mature crops, regardless of the form of phosphates applied, soil conditions and plants grown.

These late feeding habits of plants and the high proportion they take from the soil emphasize the need for the fertilizer user to keep a high available phosphorus level in the soil. It shows also, the necessity of applying more P_2O_5 to a soil than is removed by the growing crop. It is a desirable practice then, to keep improving the phosphate level in most soils. Most research and extension agronomists indicate that it is not necessary and even may not be economical, to have the fertilizer phosphorus more than 50 to 70% water soluble for most crops and soil conditions.

Recent changes in the conception of phosphate movements through the soil may be roughly divided into two methods. One is the slow diffusion method. For simplicity this can be stated as a slow diffusion of the less soluble phosphate into and through the soil moisture film without much movement of this water film in the soil. It can readily be seen that such a method could not supply sufficient phosphorus to the plant root if the phosphate level in the soil is low or the soil phosphate compounds are relatively insoluble.

The other method has been termed bulk movement of the phosphate compounds. This method can be described as a mass movement of both the dissolved phosphate and the soil water through the soil. Most of the soil investigators believe that this bulk movement of the phosphorus in the soil is the most important method of keeping the plant roots supplied with ample phosphorus. It helps explain the high proportion of soil phosphorus used in the late stages of plant growth.

Every year new evidence is being released by the various research workers on the need and reaction of phosphates in the soil. Often this information points out the need for available phosphate or phosphate fertilizer even on soils with a high phosphorus content. A high portion of agronomic and soil research is still pointed to some phosphate problem. All of this work indicates that phosphorus will be an important part of fertilizers for some time. These research data may change many of the present conceptions and ideas on phosphate use.

INSIDE STORY — After carrying phosphoric acid from the Brewster, Fla. plant of American Cyanamid Co. for 18 months, the interior of this tank car is inspected for possible damage. Left to right are A. T. Baldwin, Jr., Lithcote Corp., Melrose Park, Ill.; Louis Zarea, General Transportation Corp., and R. J. VanNostrand, American Cyanamid Co. The Lithcote firm had lined the interior of the car with baked-on Polyvinyl chloride (PVC) plastisol lining in October, 1959. After 18 months of service, the interior of the tank was found to have withstood the corrosive action of the acid.

Blending Plant Approved

SALEM, ORE.—A fertilizer blending plant here received the green light recently from the city planning commission. The facility is being built by Western Farmers Assn., Seattle, Wash., and is to comprise a 22,000 sq. ft. fertilizer manufacturing plant located east of the Oregon State Penitentiary.

An objection to the location of the plant was voiced, however, by Harry Thorp, spokesman for a citizens' committee in that area of the city. He said he did not object to the fertilizer plant as presently proposed but stated he was afraid there might be other operations which could prove hazardous.

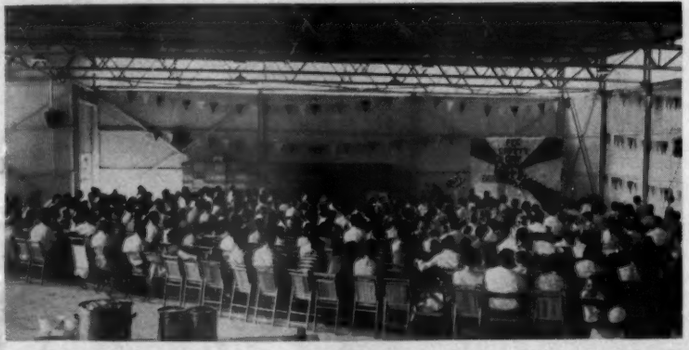
Farmers Chemical Co. Celebrates 3 Years Without Lost-Time Accident in Plant

JOPLIN, MO.—Farmers Chemical Co. recently celebrated the achievement of completing three full years of operation without a single lost time accident in the plant. On June 1, a crowd of 450 employees, their wives and children, plus officials of the company, gathered at the plant to celebrate the third consecutive safe year of work.

According to John A. Brisbin, personnel supervisor, the safety record has now extended to three quarters of a million safe hours of work at the plant which produces phosphoric acid and pelleted ammonium phosphate fertilizers.

Employees of the company were honored at the celebration by the awarding of individual safety awards. Other features of the program included a barbeque, games, entertainment, and an address by J. L. Shopen, safety director of Cooperative Consumers Assn., Kansas City, Mo.

Olin Hughes, representative of Missouri Farmers Assn. Mutual Insurance Co., Columbia, Mo., presented a commemorative plaque to Walter R. Horn, general manager of Farmers Chemical Co.



SAFETY CELEBRATION—Part of crowd of 450 attending Farmers Chemical Co. observance of three consecutive years of plant operation without a single lost-time accident. Employees, their families, and officers of the company were on hand to participate in awards, a barbeque, and games. The meeting, held in the company's bagged fertilizer warehouse, featured a talk by J. L. Shopen, CCA, Kansas City. Standing in background are Walter R. Horn, FCC general manager and A. Walter Casada, sales coordinator and master of ceremonies at the meeting.

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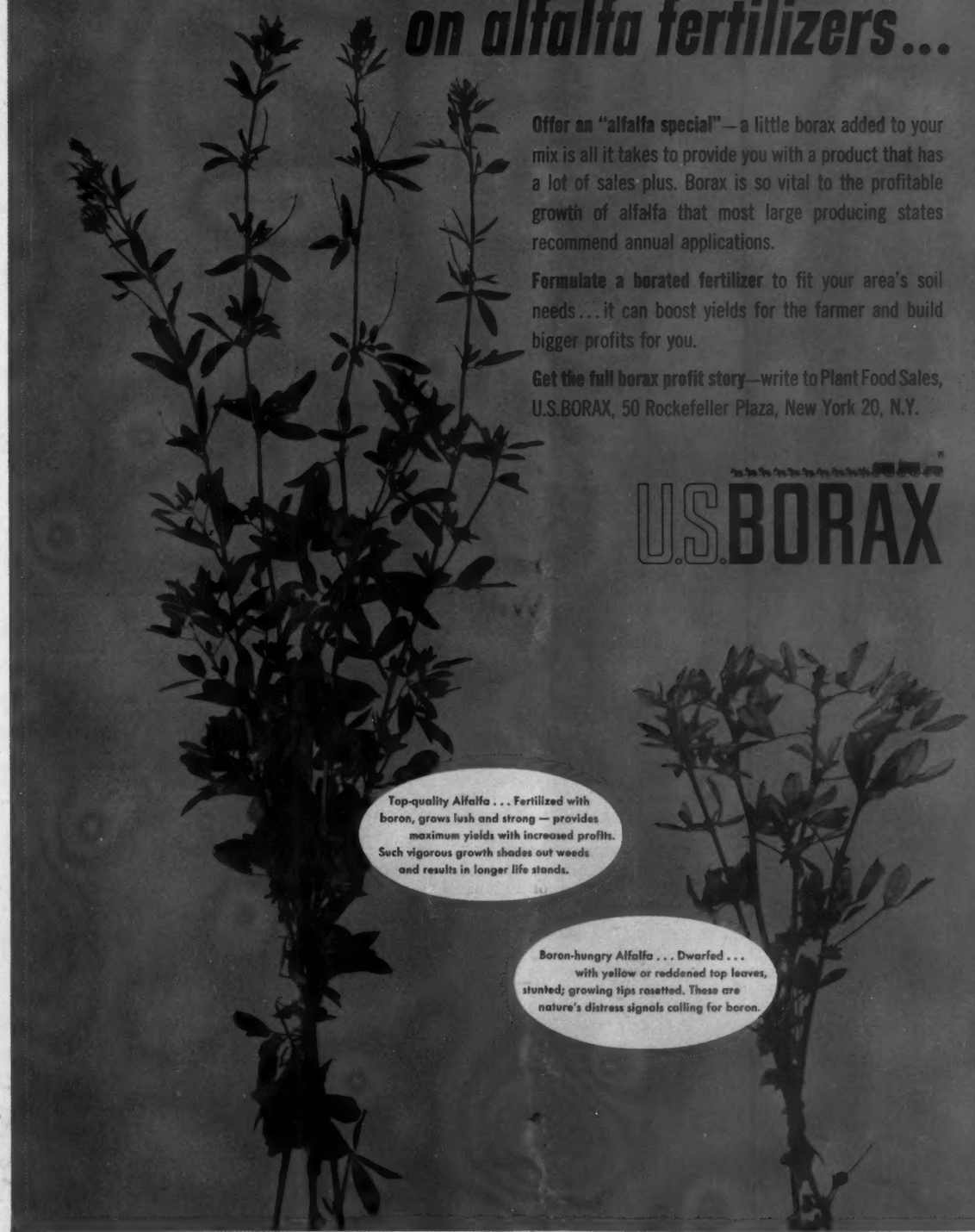


Top-quality Alfalfa . . . Fertilized with boron, grows lush and strong — provides maximum yields with increased profits. Such vigorous growth shades out weeds and results in longer life stands.

Boron-hungry Alfalfa . . . Dwarfed . . . with yellow or reddened top leaves, stunted; growing tips rosetted. These are nature's distress signals calling for boron.

Indiana Firm Steps Up Plant Efficiency For Faster Service

WHEN FARMER customers phone Senesac Fertilizers, Inc., Fowler, Ind., for solid plant food, they know the order will be "in the bag" by the time they drive in to pick it up an hour or two later.

By giving farmers what they want, when they want it, and the way they want it, the Senesac firm has grown in less than a dozen years from its original two-man operation with a couple of lime trucks, into a valuable modern plant with 15 employees and two-way radio communication to its service cars and trucks in the field.

The Senesac company prides itself in being "Johnny-on-the-spot" to hundreds of farmers. This alert attitude has resulted in an estimated 50% increase in business since the company incorporated in 1956. A number of factors have entered into these prosperous developments.

One is Senesac's reputation for prompt service, even during the rush of the spring planting season. The company has devised production shortcuts, accelerated its bagging operations, and in other ways eliminated unnecessary motions which tended to reduce efficiency in the plant.

Bagged materials account for about 80% of the company's mixed fertilizer output, and as the company's volume grew, the bagging operation took on more and more significance as being a factor in the efficiency of the firm's production.

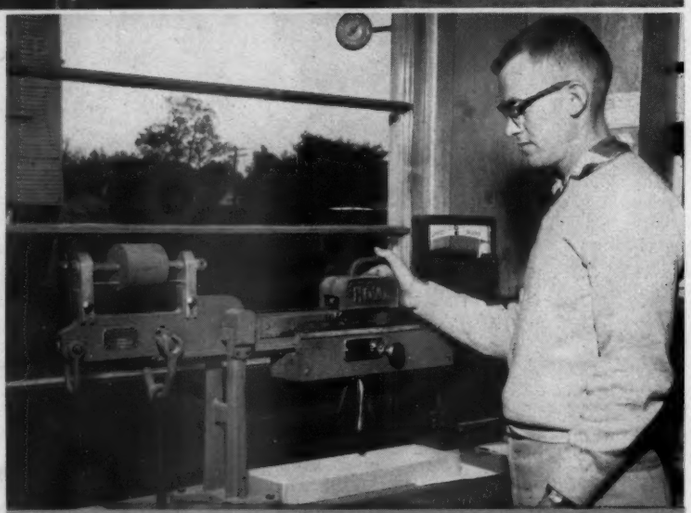
Thus, the company's owner, W. A. "Red" Senesac, ordered an overhaul of the bagging operation early in 1961, as part of a three-phase expansion program. Mr. Senesac, with a packaging engineer from Union Bag-Camp Paper Corp. surveyed the plant to determine ways in which the bagging operation might be simplified and accelerated.

As a result of the survey and subsequent recommendations, the Senesac company started use of fertilizer bags containing polyethylene coated inner liners. The company reports this resulted in elimination of bag rot and at the same time strengthened the protective qualities of the package.

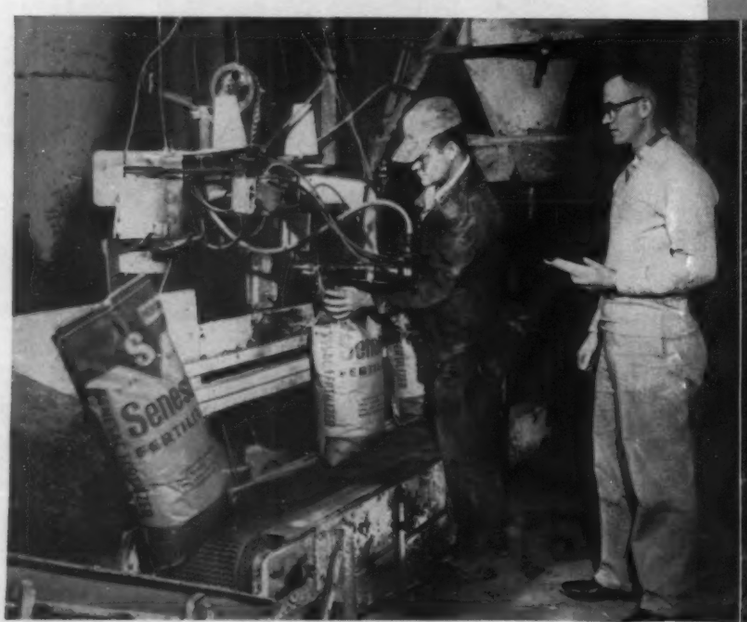
While in the process of revamping the bagging setup in the plant, Mr. Senesac had the packaging firm redesign the bag so the company's signature is visible at a greater distance than the old package design. Six separate fertilizer analyses are now pre-printed for the most popular corn, oats and wheat mixes in the Fowler area. These include 6-32-10 for winter wheat, 12-12-12 for wheat and oats, 6-24-24 for general crops, and special grades made by Senesac 6-32-10 and 5-20-30.

A newly-installed sewing head actuator, in conjunction with the new Union-Camp I & C bagger, starts and stops the sewing operation automatically, replacing a foot-operated switch. A micro-switch, actuated when the bag touches the sewing head, starts the operation. As soon as the sewing head sews the top of the bag closed, the attachment automatically stops the sewing head and cuts the thread chain on the sewn closure.

The other two phases of the company's expansion and improvement program increased storage space for bulk and bagged fertilizer by 50% and added eleven 10,000 gal. vertical tanks to its liquid plant. The plant's nitrogen solution and liquid plant



EFFICIENT PRODUCTION—Senesac Fertilizers, Inc., Fowler, Ind., has recently improved its facilities for bagging dry fertilizers. New setup has resulted in faster service to customers, helped increase volume. At top is sewing head actuator and new I & C bagger in background. Mr. Senesac says bagger automatically weighs and fills 50-lb. bags at capacity of 25 a minute. Above is Bernard Gick, secretary-treasurer of Senesac firm, weighing customer's truck outside window. Truck will be loaded with bagged goods. Below, left, is scene in Senesac storage area, showing visibility of firm's brand name on bags. Electric conveyer helps load trucks more quickly. Below is W. A. "Red" Senesac, president of firm, examining soil structure at customer's farm near his plant at Fowler, Ind.



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In closing the Chief says "How". Which means: if there's any way the Pee-Cee-A scout in your territory can be of service to you, send him a smoke signal and tell him "How".

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foods storage capacity now totals 150,000 gallons.

In another move early this year to increase its efficiency, Senesac put its two field cars, two pickup trucks and all spreader trucks within earshot of the office by installation of a two-way radio network, using the new citizens' wavelength.

"All these improvements are aimed at helping us to continue meeting a widening variety of demands which our customers are making in order to get higher yields from their crops," Mr. Senesac says. He adds that his company has been anticipating and meeting these demands ever since 1952. In that year, "Red" Senesac designed and built one of the country's first liquid nitrogen applicators and today a company affiliate—comprised of two former employees—operates this type of nitrogen rigs on a custom basis, while the rest are rented out on a "do-it-yourself" basis.

With these rigs and three dry spreaders and two liquid spreaders, the company serves the fertile Indiana farming area around Fowler.

In addition to these services, a planning and record service relieves a large number of customers of the burden of soil record-keeping.

Customers get a yearly record of crop rotations, lime and fertilizer history maps, together with a recommendation for the coming year based on soil tests, past crops and fertilizer treatment, along with consideration of recent scientific and economic research.

Senesac implements this planning service with a wide variety of basic fertilizer mixes, and trucks designed especially for spreading plant food.

Its improvement program completed, the company expects to continue, for a long time, its policy of fertilizer "the way you want it, when you want it."

Polyethylene Sleeve Bag Announced by Chase

NEW YORK—Chase Bag Co. has announced a new type valve bag design which it calls "Chase Poly Insert Sleeve." The new product features a polyethylene-film sleeve fitted into the valve notch and extending inside the bag. It comes in both sewn and pasted end multiwall shipping sacks, Chase says.

The makers claim that flexibility and self-cling characteristics of the polyethylene permit a tight, self-sealing closure, with good performance during automatic packing operations, shipping and storage. They also name other features as easy placement on filling tube; no tuck-in sleeve, and full moisture protection in the sleeve area.

The package has been field-tested in shipments of fertilizers and other products. Tests with other products are currently in progress, Chase says.

NEW TYPE VALVE — Construction of new polyethylene sleeve is shown above. At top is inside view of valve, unstitched and spread open. At lower right is outside of valve notch with tape sewn in place. The innovation was made by Chase Bag Co.

New Midwest Terminal For American Oil Co.

CHICAGO — An anhydrous ammonia terminal for more efficient service to customers in nearby areas and throughout the Midwest will be built by American Oil Co. at Joliet, Ill., it was announced by C. J. Struble, manager of the American Oil Nitrogen Products Department. He said the terminal storage facilities will enable the company to receive, store, and reship anhydrous ammonia by rail, water, and truck transport on a 24-hour basis. He pointed out this will expedite shipments during the peak demand season.

Mr. Struble said that construction of the terminal recognizes expansion of the nitrogen products market and the need for additional distribution facilities.

The terminal will be constructed next to the Amoco Chemicals Corp. plant on the Des Plaines River, seven miles southwest of Joliet, according to Mr. Struble. Storage will be provided for 15,000 tons of anhydrous ammonia in a low-pressure refrigerated tank. The Chicago Bridge & Iron Co. is the contractor for the terminal and construction is scheduled to begin immediately. Cost of the project was not disclosed.

SYMBOLS OF PLANT LIFE

In medieval times, the "black art" of alchemy was condemned by superstitious authorities hardly less ignorant of chemistry than the masses. To avoid persecution . . . and possible execution . . . for witchcraft, alchemists invented secret symbols for use in their experiments with potash and other basic elements.

TODAY, EXPERIMENTS ARE STILL BEING MADE WITH POTASH . . . BUT NOW NO SECRETS SURROUND ITS IMPORTANCE IN AGRICULTURE.

FOR THE PRODUCTION OF QUALITY FERTILIZERS, SOUTHWEST POTASH CORPORATION SUPPLIES MIXERS WITH DEPENDABLE HIGH-K® MURIATE—IN STANDARD, COARSE AND GRANULAR GRADES.

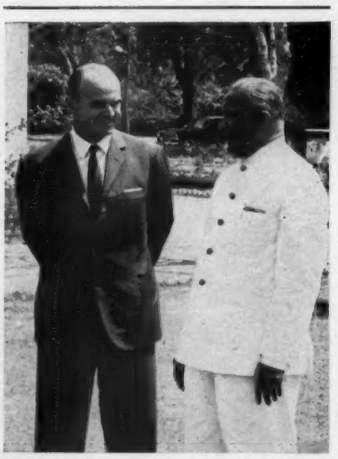
17th Century Oven and Still

SOUTHWEST POTASH CORPORATION

1270 Avenue of the Americas, New York 20, N.Y.

HIGH-K

*A 15th Century Symbol for Cribbled Ashes



STUDY TOUR — Thomas M. Ware, left, president of International Minerals & Chemical Corp., talks with Dr. S. K. Patil, India's Minister of Food and Agriculture, during the former's recent tour to study India's fertilizer needs. IMC, together with California Chemical Co. and E. I. D. Parry, an Indian company, have been granted a license by the Indian government to build a $51 million fertilizer plant on the east coast of India. Mr. Ware visited the site of the proposed plant at the port city of Visag. Others who visited India with Mr. Ware are: C. S. Dennison, vice president, overseas operations division; George W. Moyers, vice president and assistant to the president, and Harold Gibson, manager of manufacturing development department, overseas operations division.

Arcadian® News

Volume 6 | Nitrogen Division, Allied Chemical Corporation | Number 7

CROPS NEED GROWTH

SELL NITROGEN NOW

Crops in many sections of the country have suffered a severe set-back, due to cold, soggy weather. The effort to get crops planted—or in many cases the rush to get them replanted—has left many fields short of even normal fertilizer applications. And, with soils cold or waterlogged, the production of available nitrogen from organic matter has been slowed. The best answer to this problem is nitrogen side-dressing *now!*

Number One Need

This is the summer to sell nitrogen to perk up yellow-leaved, slow-growing crops that are obviously hungry. If there ever was a season when supplementary nitrogen would show up in extra crop growth and profits, this is it. You have the products, the equipment and the sales ability. Now is the time to feature the full line of ARCADIAN® Nitrogen Fertilizers, both liquid and dry. Every one of these ARCADIAN products has special advantages in a season like this. ARCADIAN NITRANA®, Golden URAN® and FERAN® Nitrogen Solutions are especially easy to apply fast on many acres per day the liquid way. ARCADIAN American Nitrate of Soda provides the readily available nitrate nitrogen that all crops need in a year like this. ARCADIAN Ammonium Nitrate and ARCADIAN A-N-L® provide quick-acting nitrate nitrogen plus long-lasting ammonium nitrogen in America's favorite dry nitrogen fertilizers. A-N-L also supplies magnesium needed by many crops on a wide variety of soils. And ARCADIAN UREA 45, the 45% nitrogen fertilizer, provides the most concentrated, work-saving, dry nitrogen fertilizer farmers can use.

Stir Up the Soil

In a season like this, it helps to use side-dressing applicators that stir up the soil to let air and oxygen reach the roots. Crop roots need oxygen as well as plant foods and side-dressing breaks the surface crust on the soil to let air enter. This is especially true on silt and clay soils, and even on lighter soils where flood water or beating rain has sealed the soil surface.

Side-dress Many Crops

Where corn, sorghum, cotton, sugar beets and other major crops have already been side-dressed, don't forget to sell nitrogen side-dressing for the many other crops that need an extra nitrogen push. Silage corn, late sweet corn, tomatoes, cabbage and many other vegetable and row crops need nitrogen now. It gives these crops a chance to get nitrogen fertilizer, and nature will help them catch up even in a late, slow season. Sell enough nitrogen side-dressing this summer and you can build a good reputation for providing fertilizer that makes crops *get up and grow!*

Don't Forget Grass

Top-dressing pastures and meadows is another summer practice that should pay you and your customers well. The wet spring brought on lush grass growth that used up much of the available nitrogen in the soil. Not much nitrogen has been broken down from organic matter to bring on re-growth of grass. ARCADIAN Nitrogen side-dressing not only supplies this needed nitrogen, but also takes full advantage of good soil moisture to make extra-heavy, second-cutting hay, and lush, green, protein-rich grazing through the remainder of the growing season.

Problem Brings Opportunity

If you have felt a pinch in the pocketbook through a slow May and June fertilizer season, summer sales are your best cure. Your farmer customers want to see their crops grow, but they can't be too sure of good growth and good yields. Help them now by persuading them to use ARCADIAN Nitrogen and you'll be doing the right thing at the right time.

(continued on following page)

Arcadian News for Fertilizer Manufacturers from Nitrogen Division, Allied Chemical

(continued from preceding page)

Check your supply of ARCADIAN Nitrogen Products now. Figure out which ones fit your sales area best, and make this a summer sales season to remember!

ARCADIAN Nitrogen Products

NITRANA—contains nitrate and ammonia nitrogen. Also available in NITRANA U formulation containing urea, nitrate and ammonia nitrogen. Ideal for liquid side-dressing by injection into the soil. Economical per pound of N.

Golden URAN—quick-acting and long-lasting. Contains nitrate, urea and ammonium nitrogen. A non-pressure liquid, ideal for speedy top-dressing or side-dressing—and a real money-maker.

FERAN—favorite ammonium nitrate fertilizer in easy-handling liquid form for top-dressing and side-dressing. Quick-acting and long-lasting.

AMMONIUM NITRATE—free-flowing, hard-pelleted and easy handling. America's favorite dry nitrogen fertilizer with the reliable ARCADIAN brand name.

AMERICAN NITRATE OF SODA—the proven old favorite for quick nitrate nitrogen results to bring crops along fast.

A-N-L—the free-flowing ammonium nitrate fertilizer that also supplies magnesium essential to good crop growth in many soils. Non-acid-forming, easy spreading.

UREA 45—concentrated 45% nitrogen, a real labor-saver. Dissolves readily in soil moisture or irrigation water. Spreads with the moisture to feed crops. A premium product at a practical price.

For Volume and Profit—Look to Lawn Fertilizer

You can cash in on the profitable market for lawn fertilizers next year if you prepare now to make the concentrated, easy-handling mixed fertilizers containing slow-release nitrogen that are in big demand by home-owners for lawns and gardens. This market is growing fast and quality products are taking a far bigger share of the total.

Volume is big enough now to make the specialty fertilizer business attractive. And growth per year is tremendous. Surveys indicate that home-owners spent more than $450 MILLION on fertilizers, insecticides and weed-killers in 1960—more than twice the amount they spent in 1955. Fertilizer takes the biggest share of the total, and lawn fertilizer makes up the major part of the outlay for fertilizer.

Pride and Performance

When you aim for the quality turf fertilizer market, you have a powerful influence working in your favor — the pride of the homeowner. Produce a quality product that makes it easier for the turf grower to get what he wants — a luxuriant, green, easier-to-care-for lawn — and you'll make real progress. Allied Chemical has the nitrogen and the know-how to help you make these practical, easy-to-use, concentrated lawn and garden fertilizers.

The day of selling an extra 80-pound bag of ordinary low-nitrogen fertilizer for the lawn is long past its peak. More profitable, high-analysis, high-nitrogen fertilizers are taking over the market. Whether you double or triple the plant food content per pound is not the only consideration. You provide the right high-nitrogen ratio for turf in your area,

say a 3-1-1 or 2-1-1. And you provide more plant food in a small, easy-to-handle, easy-to-store package. The leaders in this field are making money. You can too, with the right product.

What Grass Needs

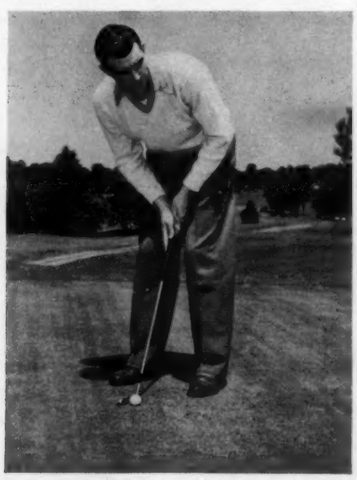
Turf experts and fertilizer experts agree that high-nitrogen balanced fertilizers are ideal for grass. The 3-1-1 and 2-1-1 ratios have been proved in use by thousands of lawn-owners. The less weight they have to lug home to give their lawns the required poundage of balanced plant foods, the better they like the results. Pride in a lawn, made by perspiration, is genuine. Pride in a lawn kept good with less work is far better—and much more apt to bring your dealers repeat customers.

Simple and Sure

To make these concentrated lawn fertilizers containing a big percentage of slow-release, long-lasting nitrogen, you need methylene ureas. The practical way to incorporate slow-release methylene ureas in your fertilizer is by using ARCADIAN N-dure, ARCADIAN Urea 45 and one of the ARCADIAN U-A-S Nitrogen Solutions. This is the way to make high-quality, high-analysis lawn fertilizers that are long on profit and volume potential. For a fertilizer containing a smaller percentage of methylene ureas, ARCADIAN DURANA Nitrogen Solution is the ideal ammoniating solution.

Many Advantages

- Methylene ureas feed nitrogen to grass at the rate grass needs nitrogen—a little every day. Fertilizer can be put down easily to keep a lawn at its best.
- You can make the methylene urea nitrogen with molecules of varying types to provide this slow, steady release of nitrogen to the grass.
- Your concentrated fertilizer with most of its nitrogen from slowly-available methylene ureas has a pleasant odor!
- Your new, concentrated, safe-to-use fertilizer will feed a 4,000 square-foot lawn from one package that is a fraction the weight of the old 80-pound bag. Think of the additional sales and dollar volume per ton! Think of the reduced shipping and storage costs and reduced display space! Think of all the lawn owners—men and women—now able to walk out of the dealer store with a small package, instead of needing a salesman to load big bags into the trunk of a car.
- Your brand name is on the best lawn fertilizer made when you produce a balanced mixture containing a high percentage of methylene urea. Every ton makes more profits and less work. And satisfied customers will build your tonnage of this premium product.



Get Ready For Fall

Now is the time to prepare for this fall as well as for '62. You can concentrate on the turf and lawn market. It's the big one. Lawn fertilizers sell well in the fall and you can get your tonnage made now for fall and spring, ahead of your rush on regular business. Just work out a high-nitrogen mixture made with ARCADIAN nitrogen materials, designed specifically for this use, along with your normal sources of phosphorus and potash. Your Nitrogen Division technical representative can help you prepare for manufacturing and marketing. Now is the time to see him for detailed suggestions on how to make money with a product designed for this market. Write now to Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Make premium grades at low cost with DURANA

If you are interested in the production of tobacco fertilizers, specialty fertilizers or other premium-grade fertilizers containing nitrate nitrogen, ammonia nitrogen and water-insoluble organic nitrogen, it will pay you to investigate DURANA Nitrogen Solution.

DURANA supplies all these forms of nitrogen economically in one ammoniating solution containing a total of 37% nitrogen. The chemical composition and physical properties of DURANA Nitrogen Solution are shown in the table on the following page.

Organic Nitrogen

Through the proper use of DURANA in manufacturing complete fertilizer, approximately 20% of the total nitrogen from the solution is converted to water-insoluble organic nitrogen in the process of producing the fertilizer. As shipped, DURANA supplies approximately 25% of its total nitrogen as nitrate nitrogen and 55% as ammonia nitrogen.

The agronomic value of nitrate, ammonia and organic nitrogen in fertilizers is well established. In addition to providing these three forms of nitrogen economically, DURANA also helps give fertilizers excellent mechanical condition and facilitates the production of granular-type fertilizers.

Exclusive Product

DURANA Nitrogen Solution is produced and sold exclusively by Nitrogen Division, Allied Chemical Corporation. It is a product of Allied Chemical research—the research that continues to help you produce better fertilizers at lower cost. For information about DURANA and other ARCADIAN Nitrogen Products, contact Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

"ARCADIAN", "NITRANA", "URAN", "FERAN", "A-N-L", "N-dure", "U-A-S", and "DURANA" are trade-marks of Allied Chemical Corporation.

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA contains 8% formaldehyde.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
[illegible]	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

NITROGEN DIVISION

MAIN OFFICE: 40 RECTOR ST., NEW YORK 6, N. Y., PHONE HANOVER 2-7300

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Memphis 9, Tenn., 1929-B South 3rd St. Whitehall 8-2692
Indianapolis 20, Ind., 6060 College Ave..Clifford 5-5443
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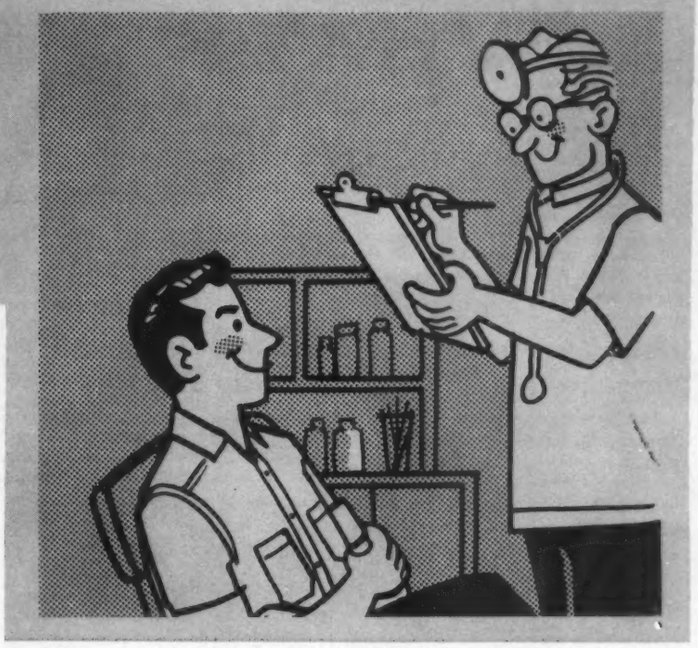
A Doctor Speaks . . .

Employee's Health Prime Consideration for Both Safety and Efficiency

By Paul W. Rush, M.D.*



ENGINEERING maximum provisions for the workers' health and safety into an industrial operation tends to enhance the profit margin and minimizes problems of production and employee relations.

Every industrial operation and procedure has a human factor. And the health, safety, alertness, state of mind, physical fitness and comfort of this human has a direct effect on the degree of success and efficiency attained in the operation or plant.

I believe the engineer should keep an image of the worker and his welfare in mind in every machine design, factory layout or work procedure.

This important cog in production machinery is a complex of intelligence, emotions, ambitions, abilities, resentments, satisfactions, drives and varying physical capacities, but nonetheless an ever-present cog which cannot be disregarded.

In addition, experience teaches that this complex worker, on the average, is ill informed on how to go about preserving his health and safety.

Added to this are common human chance-taking attitudes: "never close the door until the horse is gone," "this can't happen to me," "don't look before you leap"; and the vast majority of workers have elementary, inaccurate or no knowledge of the physical, chemical or toxic properties of material with which they may work, the effect on health of the conditions under which they may work, or what they can do individually to adequately protect themselves from any exposures or stresses they may meet on their job.

*Dr. Rush has been an industrial physician for 35 years. This article is excerpted from National Safety News, March, 1961, and used here by permission.

Two ways seem open to management in its approach to improving worker health and safety:

1. **Educate and train each worker in the safe, healthful way to do the job he or she is assigned.**
2. **Engineer and build into each operation all practical health and safety factors.**

The first method is a never-ending chore and makes the use of sound health and safety measures a function of the individual.

Workers should be carefully trained, but past experience teaches that often the individual employee disregards precautions required on his job. An accident or occupational illness results.

The second method makes health and safety measures a consideration of a team of trained people: the engineer, hygienist, doctor, architect, and safety director.

Through collaboration of these specialists, maximum measures and conformance to state and federal occupational health laws can be planned and built into every operation. On the drawing board it is relatively easy and inexpensive to incorporate minimum-hazard conditions, but not so simple, practical or inexpensive when the operation exists.

Optimal environmental conditions of temperature, ventilation, light, humidity, noise, radiant heat, and radiation are not only healthful but stimulate safer performance and higher productivity.

Consideration of human comfort and good will through washroom, toilet, shower, locker room and drinking facilities encourages personal hygiene and removes a source of irritation that may cause employee-relations problems.

Streamlined factory operations and work routines that are easily executed and require a minimum of mental and physical effort on the part of the worker often speed production and reduce fatigue, labor turnover, and personnel problems.

Occupational disease from toxic fumes, gases, dusts or other deadly materials can be prevented by confining such materials to closed processes, isolated rooms, hoods, or by regulating the air flow pattern to carry these substances away from the workers' breathing zone or skin. (In venting such materials, the possibility of significant air pollution in the community should be determined.)

Any operation—large, small, experimental or temporary—needs health and safety planning. I believe this is more true in the smaller plant, with its small work force, especially when work may be seasonal or highly competitive.

Ways of providing a healthful, safe industrial setting are detailed in many books and articles. Much human suffering and expense could be saved if this material received constant attention and application.

I should like to add one personal observation, not having to do with occupational disease and not primarily an engineering problem.

I refer to the ordinary diseases of life—the costliest industrial health problems—especially the degenerative diseases, hardening of the arteries, heart trouble, arthritis, and similar ailments. These, along with acute infectious diseases, are the ones that cost industry dearly.

I would like to suggest that consideration be given to plant medical departments with a program that goes beyond the care of industrial injuries or occupational diseases. Such medical services might be oriented toward the task of helping healthy workers stay well, and educating those with already detectable disease on means they may use to slow up or arrest the progress of their condition.

Cyanamid to Expand Louisiana Ammonia Manufacturing Unit

NEW YORK — American Cyanamid Co. has announced plans for a $3 million expansion of its anhydrous ammonia production facilities at the firm's Fortier plant near New Orleans, La.

According to Kenneth H. Klipstein, Cyanamid president, the new production facilities will increase the plant's anhydrous ammonia capacity by approximately 40%.

Cyanamid's plans also call for more than doubling the anhydrous ammonia storage facilities at Fortier and providing additional railroad and tank car loading facilities.

Construction is expected to start this summer and the expanded facilities are scheduled for completion in late 1962. In addition to anhydrous ammonia, Cyanamid's Fortier plant produces acrylonitrile, sulfuric acid, hydrocyanic acid and ammonium sulfate.

Tonnage Increase for Idaho During 1960

BOISE, IDAHO—About 15% more commercial fertilizer was registered for sale in Idaho last year than in 1959, according to a summary by Charles Painter, soils specialist of the University of Idaho extension service. His report is based on figures compiled by the Idaho state department of agriculture, here.

Slightly more than 150,000 tons of commercial fertilizer were registered for use in Idaho in 1960. This is an increase over 1959 of about 19,000 tons. The figures are for fertilizer on which tonnage tax was paid. Leland Fife, director of plant industry, said they do not necessarily show farm use but amount registered for sales. Total value of the 1960 fertilizer was about $14 million.

TRAPS ABANDONED

PROVIDENCE, R.I. — Apparently Japanese beetles have won their Rhode Island battle against the familiar old bootle traps.

Approximately 500 property owners who have been renting the traps from the state each year have been informed by Rudolph D'Andrea, chief of the Division of Entomology in the State Department of Agriculture and Conservation, that the program has been abandoned.

The official explained that the expense "outweighs by far the benefits" and that beetles attracted by the isolated traps wind up doing more damage to the users' foliage.

Fertilizer Development Affiliate Is Formed by Interore Corporation

NEW YORK—International Fertilizer Development Corp., a newly-formed affiliate of International Ore & Fertilizer Corp., has been set up to expand the services of the parent firm, according to Christopher J. Pratt, vice president in charge of operations for the new firm.

Mr. Pratt said that in its more than 20 offices in cities throughout the world, the firm already has personnel familiar with fertilizers, shipping problems, foreign exchange and world trade. It also has technical personnel available to aid in solving problems having to do with the chemical aspects of manufacturing. The new affiliate will add a new service by assisting in the engineering of new plants which would utilize as raw materials, products in which Interore has an interest.

Although the complete range of services has not been defined, the company states that it will not engage in plant construction or operation itself, although it may render advice on the technical and economic problems involved in building new plants or remodeling old ones. Likewise, the firm will advise on how to secure engineering services, loans, and information on new processes and techniques, materials handling, storage and distribution.

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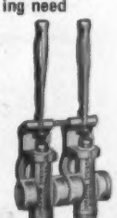
SPRAYING SYSTEMS
SPRAY NOZZLES
and related equipment
in brass, stainless steel, aluminum and Nylon to meet every farm spraying need


TeeJet Spray Nozzles write for Catalog 30
ACCESSORIES—complete choice of strainers, connectors, spray guns, nozzles for broadcast spraying, valves and fittings.
DirectoValve with Nylon body for selective spray control of booms. Write for Bulletin 100.
Diaphragm Pressure Relief Valve—write for Bulletin 101.

SPRAYING SYSTEMS CO.
3214 Randolph Street
Bellwood, Illinois

WHAT'S NEW

IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

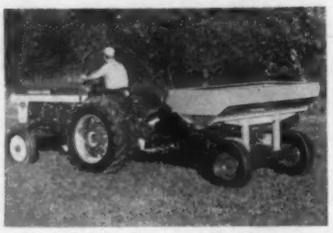
No. 9405—Dust Separator

The Day Co. has published a new 12-page, illustrated brochure giving complete details of their Day "HV" centrifugal dust separator. The manufacturers say the separator can be used for a wide range of applications and successfully handles fibrous, granular, abrasive and fine or

coarse dusts, and can be used on pressure or vacuum. For free copy of the bulletin check No. 9405 on the coupon and mail.

No. 9402—Seed and Fertilizer Broadcaster

The Belt Corp. has introduced the "Brod-Kastor," a machine designed to spread pelleted and granular fertilizers. The manufacturers say wide,



fast coverage is achieved, and that a vibrating hopper bottom insures a constant, steady flow of fertilizer, reduces stoppages, and allows easy cleaning. To allow for simultaneous seeding and fertilizing, seeding attachment is equipped with an agitator and adjustment valve for accurate flow. For complete information check No. 9402 on the coupon and mail.

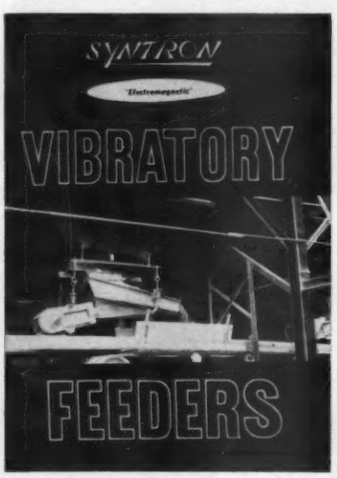
No. 9397—"Takeups" Booklet

Link-Belt Co.'s complete line of takeups, in seven frame styles and equipped with sleeve, ball or roller bearings, is described in a new 16-page booklet. The publication lists more than 320 different takeup units, designed to provide an easy means for adjusting head or foot shafts

on conveyors or elevators. Complete information for selection and application with dimensional data for each frame is given. To obtain a copy of the new book check No. 9397 on the coupon and mail.

No. 9401—Vibratory Feeder Catalog

Syntron Co. has announced the publication of a 46-page catalog section on Syntron electromagnetic vibratory feeders. Complete descriptions, data and specifications, along with over 100 illustrations for the company's line of small, heavy and extra-heavy duty standard feeders



are presented. In addition, information is given on the company's spreader feeders, vibratory conveyors and elevator feeders. For free copy check No. 9401 on the coupon and mail.

No. 9412—Sulphur Manual

Texas Gulf Sulphur Co. has released Section V, "Sulphur in Plants and Soils," which is another in the series of additions to their Sulphur Manual. Section V discusses uses of sulphur and its derivatives in soils as plant nutrients and soil conditioners. This 24-page section was prepared and edited by Dr. Firman E. Bear. For individually bound copy check No. 9412 on the coupon and mail.

No. 9396—Quick-Opening Bag Closures

A quick-opening closure for open-mouth and valve multiwall bags, developed by Bemis Bro. Bag Co., is

now available in most parts of the country. The "Bemi-Strip" closure is claimed by its makers to be a time and labor-saving feature, withstanding ordinary stretch and breakage and sifting of product at the seam. Feed, fertilizer and other similar products have been shipped in the new bag. For further information check No. 9396 on the coupon and mail.

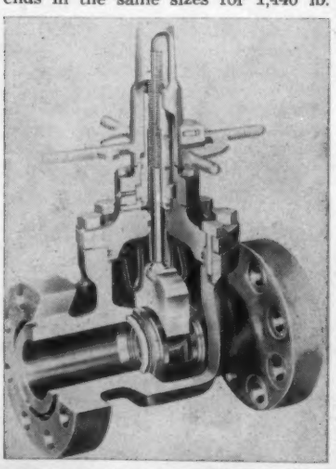
No. 9411—New Rail Car Retaining Strip

Bemis Bro. Bag Co. has developed a new paper retaining strip said to prevent slippage of rail-shipped products into storm doorways. The new strips have no steel bands and require no special tools or materials. They are constructed of heavy-duty

extensible kraft paper, reinforced with fiberglas scrim and rovings, and are installed across the doorway by built-in nailing strips. They are available for 6 through 10 ft. doorways, in heights of two or three feet. For complete details check No. 9411 on the coupon and mail.

No. 9410—Plastic-Coated Valves

Edward Valves, Inc., subsidiary of Rockwell Mfg. Co., announces a new plastic-coated, resilient-seat gate valve, which they say has high resistance to abrasion and corrosion. The valves are available with screwed ends in 2, 3 and 4 in. sizes, rated 2,000 or 3,000 lb. working pressure. They are also available with flanged ends in the same sizes for 1,440 lb.



working pressure and 2,160 lb. working pressure. For complete description and information check No. 9410 on the coupon and mail.

Send me information on the items marked:

- ☐ No. 9364—Self-cleaning Belt Conveyors
- ☐ No. 9382—Continuous Weigher
- ☐ No. 9396—Quick-Opening Multi-wall Bag Closure
- ☐ No. 9397—"Take-Ups" Booklet
- ☐ No. 9398—Bag Closer Attachment
- ☐ No. 9401—Feeder Catalog
- ☐ No. 9402—Seed and Fertilizer Broadcaster
- ☐ No. 9403—Gate Valve Bulletin
- ☐ No. 9404—Bagging Scale
- ☐ No. 9405—Dust Separator
- ☐ No. 9407—Fertilizer Sprayer
- ☐ No. 9408—Gas Scrubber
- ☐ No. 9409—Flow Equipment
- ☐ No. 9410—Plastic-Coated Valves
- ☐ No. 9411—Retaining Strip
- ☐ No. 9413—Checkweighers
- ☐ No. 9414—Fertilizer Manual
- ☐ No. 9416—New Petro Ball Valve
- ☐ No. 9419—Portable Drum Lift
- ☐ No. 9420—Operators' Awards
- ☐ No. 9424—Fertilizer Spreader

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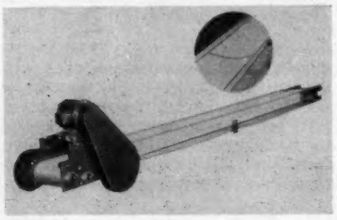
No. 9364—Self-cleaning Belt Conveyors

Finco, Inc., has placed on the market a high-capacity, light weight line of expandable, self-cleaning belt conveyors. The makers state that construction of these units permits completely expandable conveyors from 6 ft. to 65 ft. in length and from 6 in. to 24 in. in width. The new conveyor belts form natural troughs approximately 2 in. deep, and special sides prevent material from lodging under the belt, the makers claim. Crowned face steel head and tail pulleys, heavy-duty belts, heavy-duty chain and belt guards and other compo-



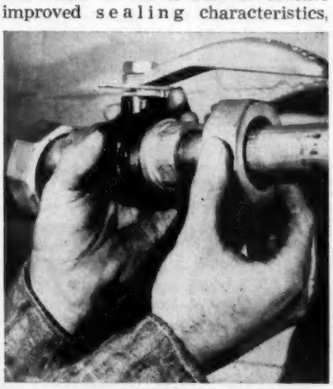
nents are used throughout in constructing the conveyor, the makers state. For additional information, check No. 9364 on the coupon and mail.

No. 9409—Automatic Liquid Flow Equipment

B-I-F Industries announces a method of combining fluid meters and proportioning pumps so that a given process will be continuous, with all units controlled from a single source. Manufacturers say that one or more "Treet-O-Units" controlled by a single pilot valve form a complete flow responsive proportioning system. It may be easily arranged for batch, constant rate, or flow responsive operation. For complete, descriptive information check No. 9409 on the coupon and mail.

No. 9416—New Petro Ball Valve

A new ball valve designed by Clayton Mark & Co. is said to feature improved sealing characteristics,



compact one-piece forging, and built-in union ends. Manufacturers say the valve is easily installed and that the simplified design of the valve body and union ends eliminates the need for nuts and bolts and an extra union in the line. For complete details check No. 9416 on the coupon and mail.

No. 9403—Gate Valve Bulletin

A new bulletin on a nylon disc gate valve manufactured by OPW-Jordan Corp. is available. It fully describes and illustrates the nylon discs used as seats. Makers say the main features of the valve are light weight, tight shut-off, good throttling action, long life, easy maintenance and low cost. Complete engineering information and specifications are contained in the bulletin. For copy please check No. 9403 on the coupon and mail.

No. 9407—Pull-Type Fertilizer Sprayer

A new 8-row pull-type fertilizer sprayer with a 1,000 gal. tank has been marketed by Finco, Inc. Man-

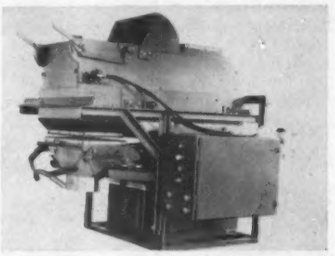
ufacturers say it is easily adaptable to small row crops. The tank is constructed of heavy-gauge steel, inside-coated with a protective material, and is equipped with a mechanical agitator. It is fitted with a reservoir filling cap, and has a special access door for cleaning. The unit is equipped with high-pressure hoses, pancake type filter, and a high-capacity pump powered by a 6.3 h.p. gasoline engine. For additional information, specifications and prices check No. 9407 on the coupon and mail.

No. 9413—Automatic In-Line Checkweighers

A well-illustrated and descriptive pamphlet is offered by Toledo Scale, Division of Toledo Scale Corp., covering their line of automatic checkweighers. The company points out high accuracy, broad flexibility, advanced design, and dependability as features of the four models illustrated. Models shown are the small package checkweigher, intermediate size, heavy duty, and the checkweigher for items of exceptional length. For copy with complete information check No. 9413 on the coupon and mail.

No. 9382—Continuous Weigher

A continuous weigh feeder, said to automatically maintain a pre-set feed rate of ½ ton to 50 tons an hour has been announced by Thayer Scale Corp. Several types are available, depending upon the material to be handled. According to the makers, the system is enclosed in a dust-tight housing, with dust collection vent, but the scale mechanism is impervi-



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ous to dust, dirt, shock and vibration. The weigher has a separate control box for automatic operation and a totalizer to indicate pounds or tons per hour at the end of a day's run. For additional information check coupon No. 9382 and mail.

No. 9424—Dry Fertilizer Spreader

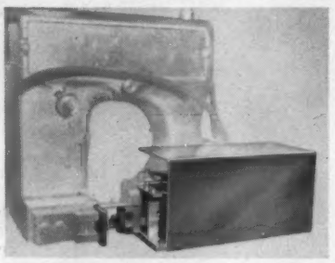
Tyler Manufacturing Co. has announced a new tractor-drawn high load capacity dry fertilizer spreader featuring a "dial-a-matic metering system" which the makers describe as being very simple to operate. Other features include a 10 in. heavy duty stainless steel conveyor, improved gusseting, a lower profile, tubular frame for greater strength. The spreader, designated as the "F-2-B," is wider than previous models, offering greater load capacity. For full descriptive details on the new spreader, check No. 9424 on the coupon and mail.

No. 9408—Gas Scrubber

A new gas scrubber for wet cleaning, absorption or cooling of gases resulting from a wide variety of industrial processes is announced by The W. W. Sly Manufacturing Co. A catalog is offered which describes and illustrates the impingement baffle plate design, with a cutaway drawing showing the flow of gas through the scrubber. Single and multiple stage scrubber units are available in capacities of 1,000 to 38,000 FCM. For free catalog check No. 9408 on the coupon and mail.

No. 9398—New Bag Closer Attachment

A new automatic thread clipper attachment has been introduced by the Minneapolis Sewing Machine Co. for its Model M-100 and stationary bag closers. Features of the new attachment, according to the manufacturer, include a thread savings of four inches per bag closed, as well as time and labor savings. The clipper is operated by a micro switch for positive action. For complete information check No. 9398 on the coupon and mail.

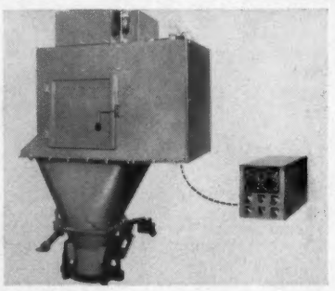


No. 9420—Industrial Truck Operators Awards

To supplement industrial truck operators' safety programs the Automatic Transportation Co. is making available three new items: A safety award, driver training diploma and driver's license that can be personalized by the company for the individuals receiving the awards. For free copies of the awards, training manuals and complete sets of safety posters check coupon No. 9420 and mail.

No. 9404—Automatic Bagging Scale

Richardson Scale Co. has introduced a new scale, which they say weighs up to 24 50-lb. bags per minute of free-flowing materials. It is equipped with a device which speeds up beam response, leading to faster feed cutoff. The makers say the new scale can weigh quickly and accurately almost all materials packaged in open-mouth bags. It is also available in stainless steel for corrosive materials. For complete details check No. 9404 on the coupon mail.

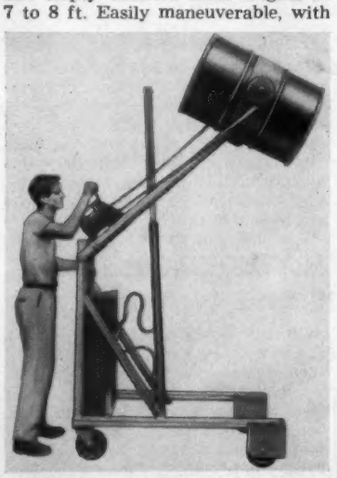


No. 9414—Fertilizer Manufacturers Manual

International Minerals and Chemical Corp. is offering its newest manual for fertilizer manufacturers, called "Purchasing for Profit." The company says a wide variety of subjects are covered in the new manual, such as record keeping, production planning and raw material inventories. Subjects such as effects of local zoning laws on plant modifications, and business and tax considerations involved in buying or leasing equipment are also discussed. For copy of the manual check No. 9414 on the coupon and mail.

No. 9419—Portable Power Drum Lift

A portable one-man drum lift has been developed by Sterling-Fleishman Co. and is said to lift drums and empty contents from heights of 7 to 8 ft. Easily maneuverable, with 8 in. diameter spark-proof wheels, it is available in AC or battery operated power packs. For further information check No. 9419 on the coupon and mail.



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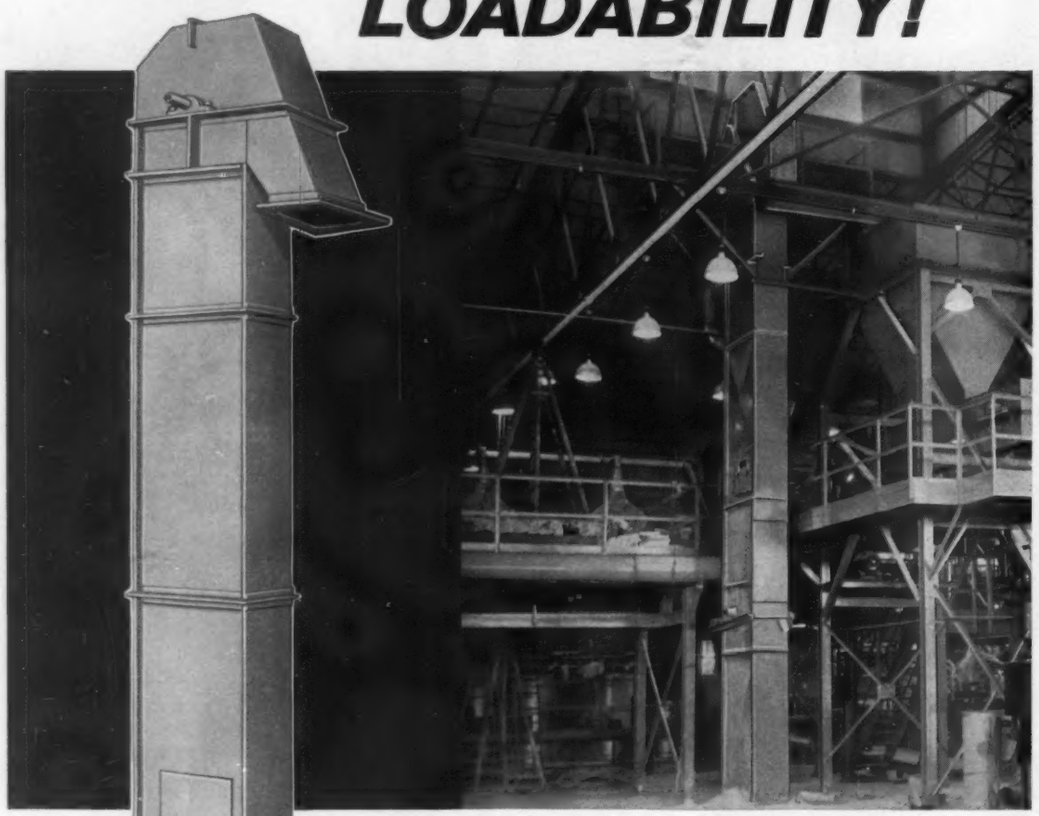

Engineers who specify conveying systems today demand quality – equipment proven to speed processing and maintain continuous material flow. They look beyond price to design and craftsmanship. An Ehrsam bucket elevator adapts to existing equipment for easy installation. Dramatically increases productivity. Ehrsam frees you from critical design and fabrication costs and bears the responsibility for efficient operation throughout its useful life. Behind quality is management's "no-orphan" policy ... Ehrsam refuses to abandon one piece of equipment in productive use. Ehrsam supplies a wide range of products to fit your material flow pattern ... at your desired pace ... for increased profits. Call one of the seven district offices below for complete information.

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EI 2-461

V-C Increases Calcined Phosphate Rock Capacity in Florida by 400,000 Tons/Year

NICHOLS, FLA. — Virginia-Carolina Chemical Corp. has increased its annual production capacity for calcined phosphate rock by 400,000 tons and incorporated several novel features, including closed-circuit television, into its operation.

Added is a new 10 x 160 ft. rotary kiln at its processing center at Nichols. This is in addition to an 8 x 110 ft. kiln that has been in operation for many years.

Until recently, V-C was the only custom producer of calcined phosphate rock. It still is the only such supplier of specification grade calcined rock, that must meet specific standards of color, pH, and organic carbon content.

In the calcining operation, wet phosphate rock is introduced into a kiln where temperatures exceeding 1,500° F. are applied. The process removes organics, bone phosphate of lime content is elevated, and the suitability for chemical processing is improved, such as in making phosphoric acid.

The new facilities include some novel features in automation and remote control of operations such as feed control, temperature and draft controls, firing rate and other features.

A variable-speed feeder, controlled by a "Weightometer," governs the flow of feed from a 1,100-ton capacity surge tank.

From an air-conditioned control room, the operator can make feed and firing rate changes as well as control oil flow, air flow, and the temperature of the finished product as it emerges from the cooler.

A closed-circuit TV set-up allows him to see inside the kiln without leaving the control room.

A conveyor belt takes the finished product from the cooler to a 100-foot high elevator, from which it is discharged onto a shuttle conveyor on top of product storage bins. About 15,000 tons of calcined rock can be stored in five bins.

Automatic protective devices are on the raw feed level, product temperature, and exhaust gas temperature. When any of these devices goes into action, an alarm sounds in the control room and a light tells where the trouble is.

All controls are interlocked in sequence. For example, an excessively high cooler discharge temperature will shut down the cooler. This in turn will shut off the kiln rotation and burner. When the rotation is stopped, the feed elevator and belts also stop.

Mississippi Chemical to Expand Pascagoula Unit

PASCAGOULA, MISS.—Authorization by its board of directors has been given Mississippi Chemical Corp. for doubling the capacity of its nitrogen fertilizer plant at Pascagoula. The new expansion program will add 200 tons to the daily output of the unit. The expansion is estimated at $4.5 million, according to Owen Cooper, president.

British Agricultural Show Gets Permanent Location

LONDON—In 1963, the famous annual Royal Agricultural Show, after more than a century of wandering throughout the great farming areas of Britain, will set up permanent headquarters in Stoneleigh, Warwickshire.

The new headquarters will occupy the 500-acre home farm of Stoneleigh Abbey, the 800-year-old estate of Lord Leigh situated in the very heart of England a few miles outside the "Shakespeare country" area. There it will become the agricultural center of Britain and a public testing ground for important farming techniques.

The first show of the Agricultural Society of England—founded to promote the cause of better husbandry by experiment and demonstration—was held in Oxford in 1839.

Letters to the Editor

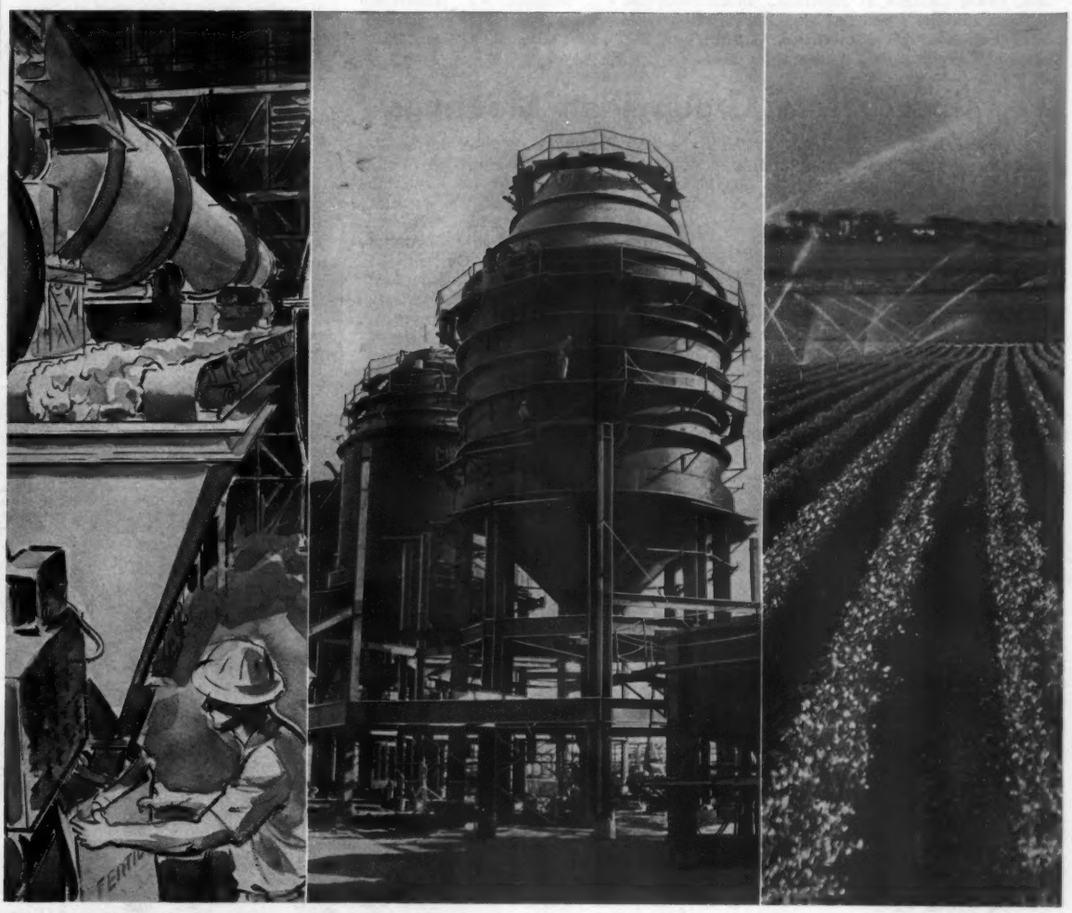
To the Editor:

The practice of making fertilizer blends is well established in this part of the country and has been followed by many companies handling fertilizers for several years. From an agronomic standpoint I do not know of any problems which cannot be solved by reasonable care and precautions. Since I am not fully aware of all the problems of fertilizer control, my remarks would be from the agronomic side of the question.

I understand that the company or persons preparing the blend have some choice on the matter of particle size of the ingredients, and that the different materials should be selected with this in mind. If materials of similar particle size and density are properly blended, apparently the mixture can be made quite uniform.

When these materials are broadcast or spread on a field a small variation in composition will not usually be so critical as to affect yields greatly. I understand that several agronomists are studying this problem and attempting to get some quantitative information on it. As I understand their results to date, agronomic results from blended materials that are carefully prepared and handled are comparable to factory-prepared mixed fertilizers.

One factor which may help compensate for slight variations in uniformity is that if the blend is slightly low in one plant food element it will normally be slightly higher in another. The increase from having one element present in slightly larger amounts tends to compensate for the lack of response obtained when another element is present in slightly lower amounts than intended. The final yield results, therefore, may be very similar although there is a small lack in uniformity of the fertilizer. —L. T. Kurtz, professor, soil fertility, University of Illinois, Urbana, Ill.



3-WAY BOOST IN POTASH

INCREASED PRODUCTION OF TRONA® MURIATE WILL SOON MEAN BETTER SERVICE...BETTER MIXED FERTILIZERS...HIGHER YIELDS OF QUALITY CROPS

Increased production of Muriate of Potash at Trona will be measured in three-way benefits. Expanded potash facilities, shown above, will soon make available from AP&CC more tonnage of free-flowing, uniform granule size Trona potash in granular and regular grades for agriculture's expanding needs. To the mixer, more quality potash from Trona will mean a better finished product... and to the grower, higher yields of quality crops.

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SUBJECT: SAFETY—Members of the executive committee of the Fertilizer Section, National Safety Council, met recently at Bartlesville, Okla. Photo taken at event shows members of committee. Standing, left to right: Robert L. Freeman, Butler Chemical Co., Galena Park, Texas; Dr. Ed Largent, Richmond, Va.; James E. Smith, Salt Lake City, Utah; M. E. Petersen, National Safety Council, Chicago, Ill.; William S. Ritnour, National Plant Food Institute, Washington, D.C.; Grayson B. Morris, Southern States Co-op, Richmond, Va.; John E. Smith, Spencer Chemical Co., Pittsburg, Kansas; W. A. Stone, Wilson & Toomer Fertilizer Co., Jacksonville, Fla.; Ed O. Burroughs, Jr., F. S. Royster Guano Co, Norfolk, Va., and George F. Dietz, Baltimore, Md.

Seated, left to right: C. S. Griffith, Virginia-Carolina Chemical Corp., Cincinnati, Ohio; John S. Mark, Farm Bureau Cooperative Assn., Inc., Columbus, Ohio; Gaither T. Newnam, Smith-Douglass Co., Norfolk, Va.; Ansell I. Raney, Phillips Chemical Co., Bartlesville, Okla.; Paul T. Truitt, president, National Plant Food Institute, Washington, D.C., and Mike C. Ellison, Mississippi Chemical Co., Yazoo City, Miss.

Fertilizer Safety Group Plan Meetings

BARTLESVILLE, OKLA. — The executive committee of the fertilizer section, National Safety Council, met recently at Bartlesville, Okla., to discuss plans for a fall series of supervisor safety training schools scheduled to be conducted later this year. Dates and locations will be announced later. The group announced that the Western safety school will be sponsored by the California Fertilizer Assn., but all others will be under the sponsorship of the National Plant Food Institute.

Ansell I. Raney, Phillips Chemical Co., Bartlesville, Okla., chairman of the group, announced that the booklet, "A Safety Guide For The Fertilizer Industry" would be available shortly. Preparation of the booklet was a joint venture of the Fertilizer Section of NSC, and the National Plant Food Institute. Gaither T. Newnam, manager, insurance department, Smith-Douglass Co., Norfolk, Va., chairman of the program committee for the group's annual meeting in Chicago, reported that plans are well under way for an outstanding program. The fertilizer safety group meets in Chicago at the Pick-Congress Hotel during the National Safety Congress, Oct. 16-20.

Planters Agricultural Chemical Co. Opens New Pesticide Facilities at Arkansas Site

PINE BLUFF, ARK.—Planters of Pine Bluff, manufacturer and distributor of "Razorback" brand mixed fertilizer and fertilizer materials, has announced the opening of Planters Agricultural Chemical Co. The new Planters company will manufacture liquid insecticides.

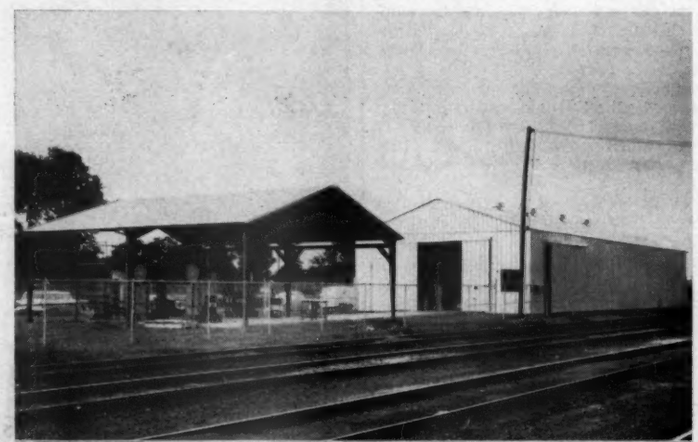
Heading the technical staff of the firm will be Dr. Paul J. Talley. Dr. Talley has served as an instructor at Baylor University, Texas A&M College and the Delta Branch Experiment Station at Stoneville, Miss. He has been associated with Monsanto Chemical Co. in development of herbicide and nitrogen programs.

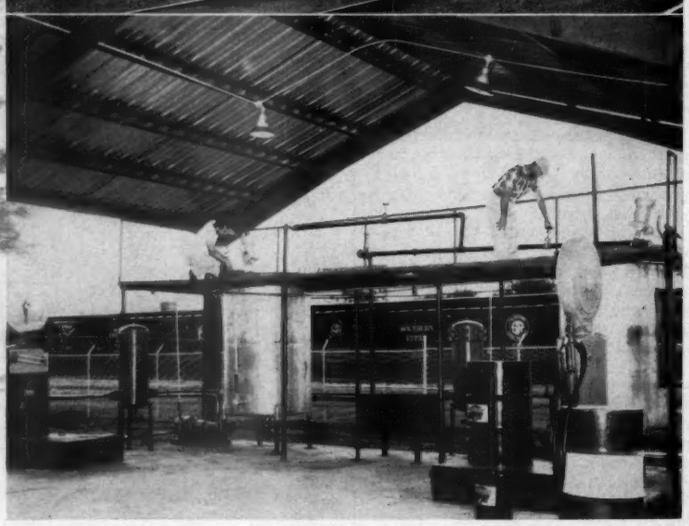
Bill Dunklin is sales manager of Planters Agricultural Chemical Co., while Bob Chaney and Leroy Brooks, University of Arkansas entomologists, will assist in both technical and sales service.

Manufacturing facilities at the new plant include stainless steel electric heated kettles, filters, scales and other modern formulating equipment. A warehouse for raw material storage has already been erected, while another structure containing product storage facilities and offices will be completed soon.

The plant will be operated in conjunction with and under the supervision of the Niagara Chemical Co. For several years, Planters has distributed a line of liquid insecticides, but the modern plant, manufacturing its product in Pine Bluff, was constructed only recently. The buildings were manufactured and erected by Varco of Pine Bluff.

Planters Agricultural Chemical Co. is affiliated with Planters Fertilizer & Soybean Co. and Planters Cotton Oil Mill, Inc., Arkansas companies operated by the four Dunklin brothers, George, Bill, Louis and Jim.





NEW PESTICIDE FACILITIES—Planters Agricultural Chemical Co. has erected new processing and storage facilities in Pine Bluff, Ark. Top photo shows exterior of these facilities. In lower shot, workmen adjust controls of processing equipment at new plant. The company, affiliated with Planters Fertilizer & Soybean Co. and Planters Cotton Oil Mill, Inc., is a new venture by the four Dunklin brothers, George, Bill, Louis and Jim.

3-WAYS BETTER:

this MFG DRY FERTILIZER HOPPER

1. Corrosion resistant to chemicals, rust and weather
2. Durable to withstand impact and abrasion of dry mixes
3. Translucent—to reveal level of contents at a glance

Planter makers use MFG hoppers for a variety of other advantages, too: light in weight; lifetime service means no replacing; seamless one-piece molded unit for greater strength; no deterioration of any kind.

Special sizes and shapes can be custom molded for your specific application needs. Write for details.

MOLDED FIBER GLASS BODY COMPANY
4643 Benefit Avenue, Ashtabula, Ohio

NFSA Plans Fall Meeting in Chicago

PEORIA, ILL.—The annual convention and trade show of the National Fertilizer Solutions Assn. will be held at the Edgewater Beach Hotel, Chicago, Oct. 30-Nov. 1, according to W. Harold Schelm, executive secretary.

In charge of convention planning is Ed O'Nan, Sturgis, Ky., who states that the 1961 convention is expected to be the largest one NFSA has ever held. Details of the program are being worked out, he said, and one entire floor of the hotel has been set aside for conference rooms.

County Agents Assn. to Meet in New York City

NEW YORK — The 46th annual meeting of the National Assn. of County Agricultural Agents is scheduled for Sept. 10-14 at the Waldorf-Astoria Hotel, New York, according to an announcement by Howard H. Campbell, Mineola, N.Y., president of the association.

Theme of the meeting will be "Marketing in Action," which will be developed through tours, speakers, and panel discussions. Full details of the meeting program will be revealed later, Mr. Campbell said.

How Union-Camp's 5-Star Plan saved multiwall user up to $450 per carload of bags

This is a new kind of "Big-Inch" story.

A major mid-west packer* wasn't convinced his multiwall bagging operation was all it might be. Could Union-Camp's 5-Star Multiwall Plan help?

To get the answer, Union-Camp multiwall specialists visited the plant. They found that the automatically filled bags occasionally stuck in the sewing head. Also, that the sewing line tended to "belly" and form an arc pattern. The result was considerable loss in production and frequent breakage. Another problem—the bags didn't warehouse well.

"Sew-Straight" Solution

After completing their analysis, the Union-Camp men suggested installing a "Sew-Straight" attachment right onto the sewing head. The bags could now be closed with an "E" head in a perfectly straight line. And only *1 inch* from the top of the bag. That single inch made all the difference.

Less paper—less breakage

To begin with, shorter bags could be used. The savings in paper alone cut the firm's multiwall costs from between $350 to $450 a carload. Imagine the savings based on several dozen carloads a year!

Before and After. Old, semi-circular closure pattern (left) and the new closure (arrow). Note the straight sewing line, and how close it is to the top of the bag.

The new attachment also speeded production by eliminating sewing head jam-ups. Moreover, since the top closure is now identical to the *factory-sewn* bottom closure, the bags form a perfect pillow shape—no awkward ears. This makes them easier to handle . . . easier to stack. And there's less breakage and fewer rejects.

How much could you save?

Perhaps an idea unearthed through Union-Camp's 5-Star Plan could save you money. The chances are excellent. For every day, multiwall users, large and small, are reducing their multiwall costs by capitalizing on this comprehensive packaging service. Their savings run from a few thousand dollars to over $100,000 a year.

Apart from bag construction, this economy program covers bag design, specifications control, packaging machinery, and a survey of your materials handling operation. And it costs you nothing—regardless of the brand of bags you now use.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.

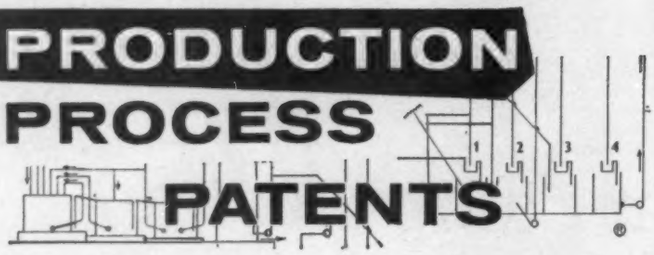
UNION-CAMP

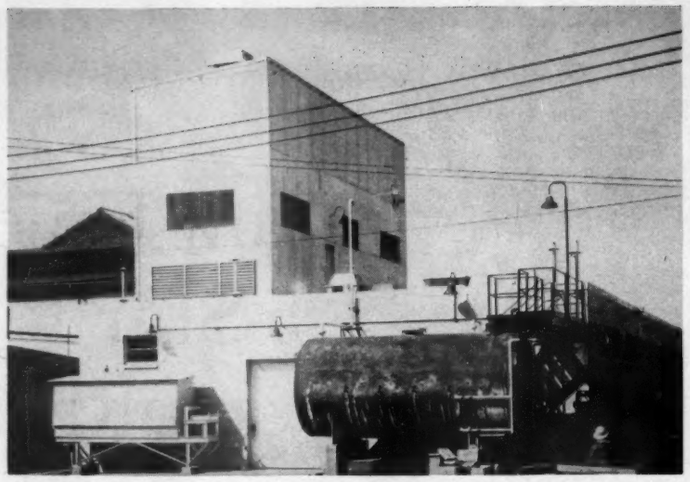
MULTIWALL BAGS

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

* NAME ON REQUEST

PRODUCTION PROCESS PATENTS

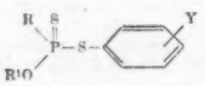




HERBICIDE PLANT—Allied Chemical's General Chemical Division has announced that its new "Urox" and "Urab" plant has recently gone on stream at Baltimore, Md. The new facility, shown above, features newly-developed processes to guarantee high purity standards and add production flexibility for the specialized liquid and solid forms of the two herbicides. The new facilities permit a 400% increase in production capacity for these products, the company says.

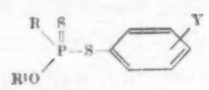
2,988,474

Novel Insecticides, Acaricides and Nematocides. Patent issued June 13, 1961, to Karoly Szabo, Yonkers, N.Y., and John G. Brady and Thomas Bruce Williamson, Santa Clara, Cal., assignors to Stauffer Chemical Co., New York. A method of killing pests comprising applying to a pest habitat a composition containing as the essential active ingredient a compound having the formula



wherein R and R' are selected from the group consisting of methyl and ethyl and Y is selected from the group consisting of hydrogen and alkyl groups having up to four carbon atoms.

A method for preparing a compound having the formula



wherein R and R' are selected from the group consisting of methyl and ethyl and Y is selected from the group consisting of hydrogen and alkyl groups having up to four carbon atoms, comprising reacting a compound having the formula

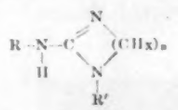
wherein X is selected from the group consisting of chlorine and bromine with a compound selected from the group consisting of thiophenol and alkyl substituted thiophenols.

2,988,440

Method of Defoliating Plants. Patent issued June 13, 1961, to Jeffrey H. Bartlett, New Providence, and Isidor Kirshenbaum, Westfield, N.J., assignors to Esso Research & Engineering Co. A method of defoliating a plant which comprises applying to said plant a non-phytotoxic liquid spray material having incorporated therein a defoliating amount of a tri-alkyl acetic acid having from 8 to 13 carbon atoms, said amount being insufficient to cause appreciable stem damage to said plant.

2,988,478

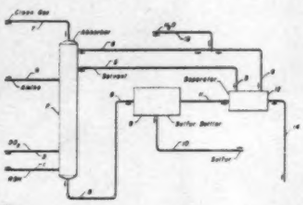
Agricultural Compositions and Use. Patent issued June 13, 1961, to Philip N. Gordon, Old Lyme, Conn., assignor to Chas. Pfizer & Co., Inc., New York. An anti-phytopathogenic composition comprising as its essential active ingredient from about 40 parts per million to about 800 parts per million of a compound selected from the group consisting of those having the formula



and the acid addition salts and quaternary alkyl ammonium salts thereof, said alkyl group containing up to four carbon atoms; wherein R is selected from the group consisting of alkyl and alkenyl groups containing from 1 to 18 carbon atoms; R' is selected from the group consisting of hydrogen, alkyl and alkenyl containing from 1 to 6 carbon atoms, the total number of carbon atoms in said R and R' groups when R' is other than hydrogen being from 7 to 24; X is an integer from 1 to 2; and n is an integer from 2 to 5; the cyclic portion of said compounds forming a conjugated system when X is 1 together with an agriculturally acceptable extending agent.

2,987,379

Production of Sulfur. Patent issued June 6, 1961, to Peter Urban, Northbrook, Ill., assignor, by mesne assignments, to Universal Oil Products Co., Des Plaines, Ill. A process for the production of sulfur which comprises absorbing sulfur dioxide and hydrogen sulfide in an organic solvent and water, reacting said sulfur dioxide and said hydrogen sulfide in contact with said solvent and



said water thereby forming sulfur, the improvement which comprises adding to said solvent an amine selected from the group consisting of N,N-dimethylaniline, N,N-diethylaniline, N,N-dipropylaniline, dimethylamine, trimethylamine, diethylamine, triethylamine, dipropylamine, tripropylamine, dibutylamine, tributylamine, dipentylamine, tripentylamine, dimethanolamine, trimethanolamine, diethanolamine and triethanolamine, whereby said sulfur is formed in a granular and more readily recoverable state, and separating said sulfur from the solvent and water.

2,988,439

Method of Preparing a Potassium Poly-Phosphate Glass Fertilizer. Patent issued June 13, 1961, to Gunter H. Gloss, deceased, late of Mundelein, Ill., by Frithie Gloss, administrator, Downey, Ill., assignor to International Minerals & Chemical Corp., Skokie, Ill. In a method of preparing a potassium polyphosphate glass fertilizer component material, the steps comprising admixing at least one substantially water insoluble compound of a minor element selected from the group consisting of copper, manganese, zinc, iron, titanium, boron, barium, strontium, lead, molybdenum, nickel, vanadium, and cobalt, and mixtures thereof, with an aqueous solution of phosphoric acid, heating the resultant slurry at a temperature between about 60° C. and the boiling point of said acid, whereby said substantially water insoluble minor element compound is dissolved, admixing a potassium salt with the resulting solution, heating said mixture to a temperature between about 250 and about 400° C., whereby said potassium salt is dissolved and a major portion of the water originally present in said solution is evaporated, said potassium salt being added in an amount sufficient to provide a potassium to phosphorus molar ratio of between about 0.25:1 and about 2.5:1, heating the evaporated material to a temperature between about 800 and about 1100° C., quenching the heat-treated material, and recovering a substantially homogeneous potassium polyphosphate containing at least one minor element.

2,988,479

Agronomical Practice for the Protection of Crops and New Composition of Matter. Patent issued June 13, 1961, to Charles R. Youngson, Long Beach, and Cleve A. I. Goring, Garden Grove, Cal., assignors to The Dow Chemical Co., Midland, Mich. A fumigant composition consisting essentially of 1,3-dichloropropene and 1,2-dibromo-3-chloropropane, the weight of the 1,2-dibromo-3-chloropropane being from about 25% to 90% of the sum of the weights of the 1,3-dichloropropene and the 1,2-dibromo-3-chloropropene.

2,987,437

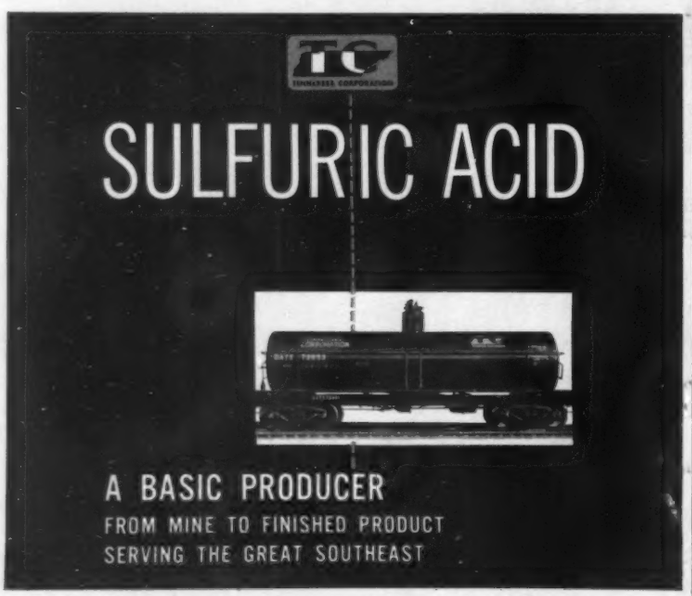
Nematocidal Composition. Patent issued June 6, 1961, to Frederick A. Hessel, Montclair, N.J., assignor to General Aniline & Film Corp., New York, N.Y. A liquid nematocidal composition comprising 40 parts by weight of 3,4-dichlorotetrahydrothiophene-1,1-dioxide and 60 parts by weight of a compound selected from the group consisting of γ-butyrolactone and 2-pyrrolidone.

2,987,376

Method for Defluorination of Phosphoric Acid. Patent issued June 6, 1961, to Gunter H. Gloss, Mundelein, Ill., assignor to International Minerals & Chemical Corp., New York. The method of removing fluorine from wet process phosphoric acid containing fluorine in undesirable amounts which comprises heating said acid at a concentration having a boiling point higher than about 250° F. to a boiling temperature in the presence of in excess of about 0.1% by weight of silica having a surface area in excess of 25 square meters per gram, boiling the resultant acid slurry whereby water vapor and silicon tetrafluoride are vaporized and removed while continuously adding water to maintain a substantially constant boiling composition boiling higher than about 250° F., withdrawing a phosphoric acid-silica slurry from the boiling operation having a P/F weight in excess of 100, and removing silica from the defluorinated acid.

2,987,436

Para-Chloroazoxybenzene Pesticide. Patent issued June 6, 1961, to Robert J. Geary, Vero Beach, Fla., as-



The Sulfur contained in the ore we process yields Virgin Sulfuric Acid of highest quality—We produce all grades and strengths of Sulfuric Acid from 60° Baume through the various Oleums.

Call JAckson 3-5024, Atlanta, Ga., or write:

TENNESSEE CORPORATION

signor to Plant Products Corp., Blue Point, N.Y. A miticidal composition comprising para-chloroazoxybenzene, a carrier therefor, and a surface active adjuvant selected from the group consisting of dispersing agents and wetting agents.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Propazine, in capital letters, for chemical compound incorporated as an ingredient in the manufacture of herbicides. Filed Nov. 18, 1959, by Geigy Chemical Corp., Ardsley, N.Y. First use Oct. 13, 1959.

Saf-T-Sol, in capital letters, for insecticide solvent. Filed Nov. 18, 1959, by Geigy Chemical Corp., Ardsley, N.Y. First use April 15, 1904.

Pesco, in capital letters, for herbicides, insecticides and fungicides. Filed July 27, 1959, by Crowley Tar Products Co., Inc., New York, N.Y.

No. 30, in capital letters, for livestock sprays and dips. Filed Dec. 26, 1957, by Hayes-Sammons Chemical Co., Mission, Texas. First use November, 1953.

Gesatop, in capital letters, for chemical compound incorporated as an ingredient in the manufacture of herbicides. Filed May 5, 1960, by Bushey & Wright, Inc., Chicago, Ill. First use Oct. 13, 1959.

C-Em-Die, in capital letters, for chemical compositions for use as a germicide, insecticide, fungicide, rodenticide, herbicide, crow repellent, room deodorant and air sanitizer. Filed June 22, 1960, by St. Lawrence Chemical Co., Inc., Ogdensburg, N.Y. First use Nov. 14, 1922.

Boon, in capital letters, for insecticide. Filed Oct. 26, 1960, by O. M. Scott & Sons Co., Marysville, Ohio. First use Oct. 17, 1960.

Phencapton, in capital letters, for chemical compound incorporated as an ingredient in the manufacture of herbicides. Filed April 30, 1959, by Geigy Chemical Corp., Ardsley, N.Y. First use April 10, 1959.

Gesaprim, in capital letters, for chemical compound incorporated as an ingredient in the manufacture of herbicides. Filed Nov. 18, 1959, by Geigy Chemical Corp., Ardsley, N.Y. First use Oct. 13, 1959.

Dipofene, in capital letters, for chemical compound incorporated as an ingredient in the manufacture of insecticides. Filed Nov. 18, 1959, by Geigy Chemical Corp., Ardsley, N.Y. First use Oct. 13, 1959.

Like-best, in capital letters, in quotation marks, for rodenticides. Filed Sept. 26, 1960, by Isadore Sparer, d.b.a. Reliable Food Products, Detroit, Mich. First use Feb. 18, 1959.

Null, in capital letters, for crab grass and lawn insect control. Filed Nov. 23, 1960, by International Minerals & Chemical Corp., Skokie, Ill. First use Nov. 10, 1960.

Tydex, in capital letters, for fertilizers. Filed Oct. 10, 1960, by The Dow Chemical Co., Midland, Mich. First use Sept. 21, 1960.

Soil-Set; Vulcanol, and Vulcanol SS, all in capital letters, for spray mulch, namely, an elastomeric polymer emulsion which forms close-fitting, porous soil cover. Filed Aug. 5, 1960, by Alco Oil Chemical Corp., Philadelphia, Pa. First use of word Vulcanol May 9, 1958.

May Way Lawn Doctor, in hand-lettered design, for preparation for killing weeds, dandelions, crabgrass and lawn insects and as an orchard spray and rose and floral dust. Filed July 25, 1958, by May Seed & Nursery Co., Shenandoah, Iowa. First use March 31, 1958.

Dicryl, in capital letters, for herbicide. Filed April 21, 1960, by Food Machinery & Chemical Corp., New York. First use March 3, 1960.

Rancher, in hand-lettered capitals, for herbicides, insecticides, fungicides, miticides, grain fumigants, grain protectants, seed treatments for disinfecting, disease and insect control, and soil fumigants. Filed Sept. 6, 1960, by Barzen of Minneapolis, Inc., doing business as Rancher Products, Minneapolis, Minn. First use April, 1959.

Drawing of Steer Head with Horns, for herbicides, insecticides, fungicides, miticides, grain fumigants, grain protectants, seed treatments for disinfecting, disease and insect control and soil fumigants. Filed Sept. 6, 1960, by Barzen of Minneapolis, Inc., doing business as Rancher Products, Minneapolis, Minn. First use April, 1959.

Wepsyn, in capital letters, for fungicides and insecticides. Filed Sept. 20, 1960, by N. V. Phillips-Duphar, Amsterdam, Netherlands.

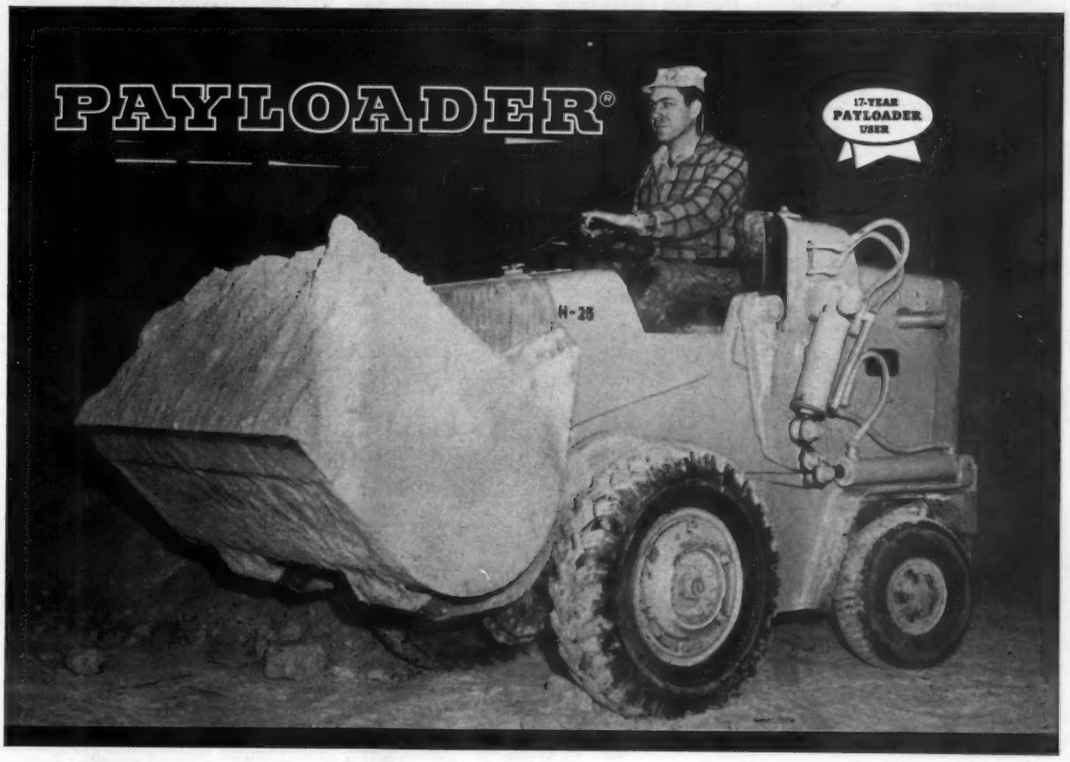
Crazy-Bait, in capital letters, for insecticide. Filed Sept. 29, 1960, by Charles Bain, doing business as Industrial Chemical Products Co., Philadelphia, Pa. First use Sept. 28, 1960.

Agri-Biz, in hand-lettered design, with outline of manufacturing plant, for fertilizers. Filed Dec. 9, 1960, by Agricultural Business Co., Inc., Lawrence, Kansas. First use Nov. 7, 1960.

TVA Reports Patents On Chemical Processes

WILSON DAM, ALA.—Tennessee Valley Authority has reported that during the 1961 fiscal year, it obtained six patents on new chemical processes. The patents involved: A process for production of granular fertilizer from calcium metaphosphate, a process for production of liquid fertilizers, an alkaline process for the manufacture of cryolite, a process for the manufacture of ammonium cryolite, a process for manufacture of cryolite from waste gases, and a manganese oxide process for the recovery of sulfur dioxide from waste gases.

During the past 28 years TVA has obtained 126 patents on developments resulting from its chemical engineering activities. Equipment and processes covered by the patents are licensed for use by private industry on a royalty-free basis.



H-25 handles 30% more tonnage

At the Home Guano Company in Dothan, Alabama, a fleet of six PAYLOADER tractor-shovels play a major role in the production of sulphuric acid and commercial fertilizers. Five Model HA's (2,000-lb. capacity) and a new 2,500-lb. operating capacity Model H-25 are used throughout the plant in all operations . . . unloading railroad cars, mixing, bagging, moving machinery, handling sulphur and general maintenance.

"We have been using PAYLOADER tractor-shovels since 1944 with satisfactory performance," says Superintendent R. C. Geiger. "In fact, we find that the new Model H-25 is giving us about 30% additional load delivery over the older HA's. It also gives us better all-around operating efficiency; it digs hard materials with less wheel slippage and is less tiring on the operator."

The Improved Performance Record turned in by the H-25 is no surprise. This loader is designed and built for time and money-saving production. It combines a 2,500-lb. capacity with complete power-shift transmission, power steering, a short, 6-ft. turning radius and power-transfer differential to move big tonnage efficiently, even in close quarters.

The H-25 Also Has Built-in Protection through many special features that guard against dust, dirt and moisture damage . . . dual air cleaner, cartridge-type oil filters, sealed and self-adjusting hydraulic service brakes, enclosed parking brake and special oil and grease seals on all vital pivot points.

Why Not Consider the possibility of reducing your handling equipment "fleet" and boosting the hourly production rate in your plant with an efficient H-25 PAYLOADER? A Hough Distributor nearby will be glad to demonstrate its cost-cutting performance. Contact him or return the coupon for more information.

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NAME
TITLE
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MEN MOVING AHEAD
In The Trade

Potash Company of America, New York, has announced the recent appointment of **Dr. Edwin C. Kapusta**, who will serve as technical sales director for PCA. The announcement was made by **Dean R. Gidney**, vice president. Dr. Kapusta will be responsible for technical service to customers, sales to the chemical industry, liaison between production and sales, and market research and analysis.

Dr. E. C. Kapusta

Dr. Kapusta's immediate past position was with U.S. Borax & Chemical Corp., but before this, was with the old National Fertilizer Assn. in Washington, D.C. He earned his doctorate in chemical engineering from Iowa State University.

●

Directors of Richmond Guano Co., Richmond, Va., on July 1, elected as president, **L. Dudley George**. Mr. George succeeds **W. E. Barret** who has headed the company since 1927. Mr. Barret asked to be relieved of his responsibilities as of June 30 this year. The board then elected him to the position of consultant for the company.

Other officers named by the board were **James H. Pate**, vice president; **George F. Helfert**, secretary-treasurer, and **Fred E. Goggin**, assistant secretary and assistant treasurer.

●

Clayton F. English, 55, executive vice president and treasurer of Sturtevant Mill Co., Dorchester, Mass., has been elected chairman of the board, succeeding **William T. Doyle**, 74, who retired in June after 57 years with the company.

Mr. English joined Sturtevant in 1947 as production manager. Mr. Doyle came to Sturtevant in 1904 and became the company's "elder statesman" in the areas of fine grinding and air classification.

Charles W. Roberts has been appointed Southwest district sales representative for Coleman Instruments, Inc., Maywood, Ill. He will serve a 6-state area from his Houston, Texas, headquarters.

●

Three additions to its research and development department have been reported by Niagara Chemical Division of Food Machinery and Chemical Corp. They are: **Dr. Jerold W. Bushong**, plant pathologist; **Dr. Kenneth R. Wilson**, organic chemist, and **Dr. Leonard B. Hertz**, field research biologist.

Dr. Bushong will work with fungicide and nematocide screening as plant pathologist at Niagara's Middleport, N.Y., laboratories.

Dr. Wilson was formerly with E. I. du Pont de Nemours & Co., Inc., in Buffalo. He will search for new pesticide materials. Dr. Hertz will be responsible for coordination of the company's chemical development work.

●

Dr. Aimison Jonnard has been named manager of market research and development for U.S. Industrial Chemicals Co., division of National Distillers and Chemical Corp. Announcement was made by **Dr. R. E. Hulse**, U.S.I. general manager.

Dr. A. Jonnard

In his new post, Dr. Jonnard will be concerned with markets for U.S.I.'s current product mix as well as being responsible for all development projects involving new products and new markets that fit into the firm's long-range planning and development program.

Dr. Jonnard joined U.S.I. in 1959. Before that, he was manager of Shell Chemical Co.'s market analysis department.

Stedman Foundry & Machine Co., Inc., Aurora, Ind., has announced the appointment of **Richard E. Schneider** as sales engineer for the states of Minnesota, Iowa, Missouri, and portions of Illinois and Wisconsin. The new appointee will make his headquarters at Moline, Ill. Prior to his affiliation with the Stedman firm, he was a uranium consultant in Colorado. He spent considerable time in the Rocky Mountain area as well as in the West and Southwest during his association with Union Carbide Nuclear Co., the General Geophysical Co., and Twin Star industries.

R. E. Schneider

●

James W. Hill has been named plant manager of the Bartlett-Snow Division of Bartlett - Snow - Pacific, newly-formed by the consolidation of the C. O. Bartlett & Snow Co. and Pacific Foundry and Metallurgy Co. In his new capacity, Mr. Hill will have charge of all manufacturing operations of the company's product lines which include rotary dryers, calciners, coolers, conveying equipment and the company's agricultural equipment lines.

Bartlett-Snow has also announced the appointment of **Edward M. Carty** as purchasing agent.

●

S. B. Penick & Co. announces that **Richard M. Collins** has been appointed sales representative for the metropolitan New York, Bronx and Westchester County area. Mr. Collins was formerly a sales correspondent with Penick, having joined the company in 1950. He holds a bachelor's degree in business administration from Pace College.

●

Witco Chemical Co., Inc., New York, has announced the appointment of **Norman P. Ottley**, as general purchasing agent for raw materials and fuels for all Witco divisions.

Previously, Mr. Ottley was with American Cyanamid Co. as assistant general purchasing agent and as an organic chemicals sales representative.

Acme Fertilizer Co., Acme, N.C., has announced the elections of **Newton J. Kelly** and **W. Clark Bellamy** to vice presidents of the company. Both will devote more time in sales promotion of the company's products.

In addition to mixed fertilizers, Acme produces insecticides and superphosphate. The latter is used in the company's own products, and is also sold to other fertilizer manufacturers.

The promotions were announced by **Thomas H. Wright, Jr.**, president.

●

William R. Bradley and Associates, Newark, N.J., has announced that **Arvil B. Pettit**, formerly director of industrial health and safety for W. R. Grace & Co. has joined its firm as a consultant on safety, fire and explosion, and marine hazards. The Bradley firm is an environmental health consultant.

A. B. Pettit

While at W. R. Grace & Co., Mr. Pettit had complete responsibility for industrial health and safety, including fire prevention and air and water pollution control of more than 70 industrial plants and mines in the U.S. and abroad.

During the period in which he worked for Grace's Davison Chemical Division that company received the Award of Honor of the National Safety Council five times in a six year period. In addition, Mr. Pettit has participated in many state and local conferences on industrial health.

●

R. B. Windhorst N. P. Uffmann

Richard B. Windhorst, sales manager of the St. Louis sales division of Bemis Bro. Bag Co., has been appointed product supervisor for textile and waterproof products. **Norman P. Uffmann**, product sales manager of the St. Louis specialty department, succeeds Mr. Windhorst as sales manager of the St. Louis sales division.

Mr. Windhorst joined Bemis in 1945, serving two years as a salesman with the Minneapolis general sales division. Mr. Uffmann, a native St. Louisan, began with Bemis as an office boy in 1933. He has spent his entire career with the company in the specialty products department, becoming assistant department manager in 1942 and manager and product sales manager in 1952.

●

Joseph A. Thompson, Little Rock, Ark., chief accountant for agricultural chemicals, Olin Mathieson Chemical Corp., has been elected to the board of directors of the National Association of Accountants. His term began July 1.

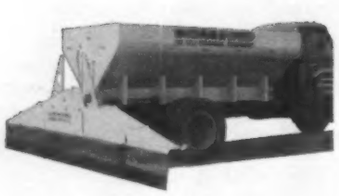
●

William C. Teach has joined U.S. Borax Research Corp. as a senior scientist, according to an announcement by **Dr. C. L. Randolph**, vice president. The Research Corp. is a wholly-owned subsidiary of U.S. Borax & Chemical Corp.

Mr. Teach was formerly technical director of American Latex Products Corp. He has held research posts with the Mellon Institute of Industrial Research and Koppers Co., Inc.

BAUGHMAN

THE COMPLETE LINE OF FERTILIZER SPREADERS



The K-BODY for Dry Fertilizer

Spreads lime and fertilizer efficiently and uniformly, in exactly the amount you want. The most rugged spreader body ever built, with fewer working parts, insuring longer service life. Exclusive lubrication-impregnated chain helps retard corrosion and prevent freezing. Your choice of 4 drives, 3 body styles, single or double distributor. Write for Bulletin A-425.

The RAPID SPREAD for Liquid Fertilizer

A completely self-contained unit; can be mounted on flat bed truck or farm wagon in 10 minutes. Spreads liquid in droplets in 40 to 60-foot pattern. Operates on compressed air, which heats and agitates fertilizer to prevent sludging in cold weather. Standard model holds 1000 gallons; other sizes built to order. Write for Bulletin A-461.

The QUICK-SPREAD for Dry Fertilizer

A versatile unit which spreads in any kind of weather; on muddy fields, rough pasture, in orchards, under low-hanging trees, and other hard-to-reach places. Holds one ton 60-pound granular; spreads an acre in 2½ minutes; spreading width up to 32 feet. One-man operation from tractor, jeep or pick-up truck. Driven from PTO or auxiliary engine. Write for Bulletin A-458.

A few choice distributorships available

Better service through better engineering. Parts and service from 200 distributors.

BAUGHMAN MANUFACTURING COMPANY, INC.

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6142

Thomas T. Aamodt, 34, entomologist for the past ten years with the Minnesota State Department of Agriculture, has joined Sprayfoil Corp., Bloomington, Minn., as manager of the requirements development section of the agricultural sprayer products division.

T. T. Aamodt

Mr. Aamodt holds membership in a number of entomological groups, including the Entomological Society of America, and has devoted much time to the toxological and taxonomical phases of entomology and plant pathology. His father, T. L. Aamodt, was active in entomological circles for 41 years as professor of entomology and economic zoology at the University of Minnesota.

Sprayfoil has also announced the appointment of **Andrew Kuehn III** as vice president in charge of financial planning, product design, and production. He was formerly assistant to the president. Before joining Sprayfoil in 1960, Mr. Kuehn was associated with Minneapolis Honeywell Regulator Co.

●

John F. Kruysman has joined the staff of Atlantic-Vulcan Steel Containers, Inc., as factory sales-service representative, according to an announcement by **Gordon D. Zuck**, president. Mr. Kruysman was graduated from Boston University with a bachelor of science degree in business administration, majoring in sales management.

●

Raymond Bag Corp. has announced the appointment of **Jerry H. Wright** to the company's sales staff. Mr. Wright was formerly with American Airlines, and is a graduate of Drake University, Des Moines, Iowa.

He has been assigned to Raymond's sales office in Chicago.

●

R. P. Perry

D. A. Clarke

R. P. Perry, manager of the Bemis Bro. Bag Co.'s Minneapolis plant and sales division, has been appointed to the company's newly created position of director of product development, **Judson Bemis**, president, has announced.

K. W. Koechig

Mr. Perry will report directly to the Bemis president. Mr. Perry will be responsible for developing effective means of planning, evaluating, budgeting, coordinating and directing the company's research and development efforts.

Mr. Perry will be succeeded in the Minneapolis managership by **Dexter A. Clarke**, manager of the Bemis plant and sales division in Indianapolis. Mr. Clarke joined Bemis in 1938.

K. W. Koechig will succeed Mr. Clarke as Indianapolis manager. He has been assistant to the manager there since April, 1959. He joined Bemis in 1943 as a sales correspondent in St. Louis.

Hayes-Sammons Chemical Co. has announced the appointment of **Marvin F. Bradney** as sales and technical representative, according to **Andrew N. White, Jr.**, vice president sales. Mr. Bradney has been assigned to the Indianola, Miss., division of Hayes - Sammons. Mr. Bradney has been a cotton scout for the school and an inspector for the USDA Division of Pink Bollworm Control since graduation from the University of Arkansas.

M. F. Bradney

●

Charles H. Freeman, formerly in the manufacturing department of Armour Agricultural Chemical Co.'s Dallas, Texas, plant, has been appointed plant manager of the company's fertilizer plant in Columbia, S.C.

Announcement was made by **H. Vise Miller**, Atlanta, vice president of Armour Agricultural Chemical and general manager of the firm's fertilizer division.

●

L. S. Madsen has been named general sales manager for the agricultural chemicals operations of Olin Mathieson Chemical Corp., **Sam L. Nevins**, corporate vice president, has announced.

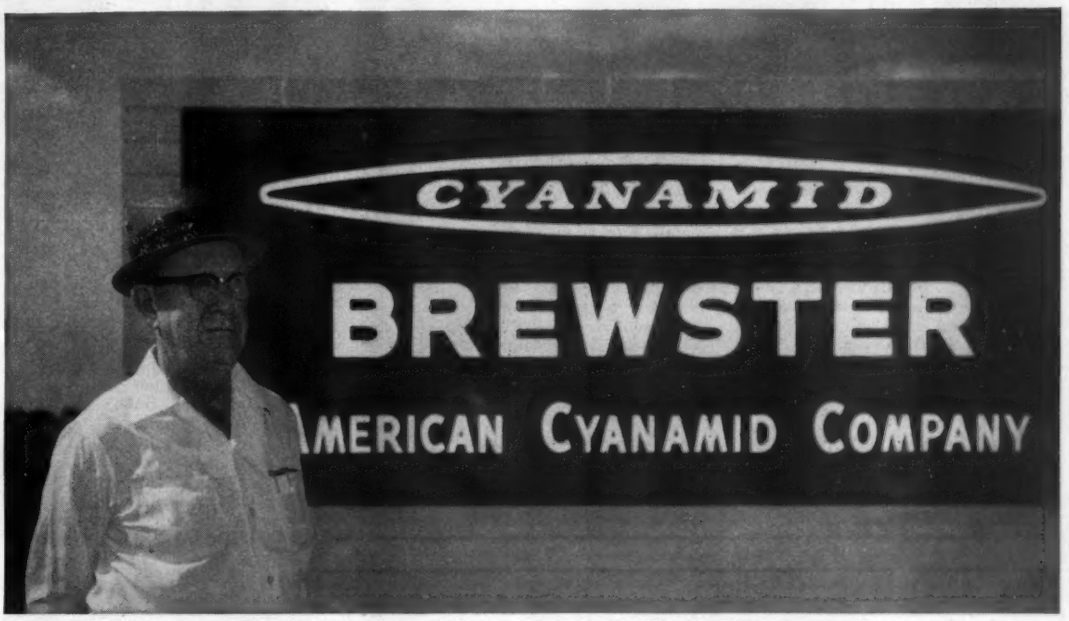
Mr. Madsen was formerly general manager of the western district at Phoenix, Ariz., but will now be located at Little Rock, Ark. He will report to **Gerald A. Wakefield**, director of sales.

Five other appointments were also announced by Mr. Nevins:

Edward W. Abrahams has been

(Continued on next page)

"Ha! I've got you . . . I have a feeling this game will end soon!"



Arthur Crago, Manager of Phosphate Operations at Cyanamid's Brewster, Florida, Plant, draws on his more than 30 years of leadership in the phosphate industry to help meet your needs for this vital element. Among his many contributions, Mr. Crago developed the "Crago Process," the first phosphate flotation method to give you the high-grade concentrates you need.

HIS BUSINESS IS MAKING YOUR BUSINESS BETTER

He's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into the kinds of products and services you can use.

Services you can use

Traffic Service: Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money, and can make your operation run even more efficiently.

Technical Service: Cyanamid's staff of technical experts are constantly at your service. Make your formulation and production problems theirs. That's their job.

Sales Service: Cyanamid sales representatives are available to work with you and for you in expanding present markets or in establishing new markets.

Products you can use

Cyanamid's phosphate business is the mining and manufacturing of the highest quality products for your mixed fertilizer requirements.

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- TREBO-PHOS®—Triple Superphosphate
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appointed general manager of the western district in Phoenix, succeeding Mr. Madsen. He formerly was assistant general manager.

Dr. Jesse L. Mellor, formerly agronomist of the western district, has been named assistant general manager of the district.

Dr. Ivan E. Miles, formerly southwestern district agronomist at Houston, has been named agronomist for both the southern and southwestern districts. His new office will be in Little Rock.

Thomas W. Crockett, manager of irrigation sales, has been transferred from the Little Rock office to Williamston, N.C., where he will report to **James C. Cooke**, southeastern district manager.

Paul F. Schowengerdt has been named special assistant to the director of sales. He was general sales manager.

●

William F. O'Brien, has been named superintendent of the F. S. Royster Guano Co. Madison, Wis., factory as of July 17. Mr. O'Brien, 36, has spent the past eight years at the Madison facility. He joined Royster in March, 1953, became foreman in 1954, general foreman in 1955, and assistant factory superintendent in 1957.

Wm. F. O'Brien

J. Frank George, Royster vice president in charge of manufacturing, said Mr. O'Brien will succeed **H. L. Banton**, who will become superintendent of the firm's Baltimore factory.

●

Edward E. Brush has been elected executive vice president of Soiltest, Inc., a subsidiary of Cenco Instruments Corp. Mr. Brush was previously vice president-sales of Soiltest, Chicago manufacturer of apparatus for engineering testing.

Burton W. Graham has been named vice president of marketing by Collier Carbon and Chemical Corp. Mr. Graham was previously director of sales for the Armour Industrial Chemical Co. He will now coordinate and direct Collier's industrial and agricultural chemical marketing organization.

Burton W. Graham

Mr. Graham is a graduate of the University of Florida and had been associated formerly with American Fluoride Corp.; Davison Chemical Co., Division of W. R. Grace & Co.; and Armour Industrial Chemical Co., Division of Armour & Co. He joined Collier earlier this year as vice president of marketing and directs Collier's industrial and agricultural chemical marketing organization.

●

Charles H. Culnane, Jr. has been appointed assistant operating superintendent in charge of SunOlin Chemical Co.'s ethylene and ethylene oxide plants now under construction at Claymont, Del., according to **James I. Harper**, SunOlin president. Before joining SunOlin, Mr. Culnane was employed by Wyandotte Chemicals Corp. for nine years where he was superintendent of the glycol plant. Earlier he was with Texaco, Inc., as a chemical engineer for seven years.

●

Judson H. Drewry, Jr., Maitland, Fla., has been promoted to regional sales manager at Atlanta. He will be responsible for the sale of agricultural chemicals in Florida, Georgia, North and South Carolina, Alabama and the eastern two-thirds of Tennessee. He was formerly regional sales representative for the potash division; southern area sales manager for the phosphate minerals division, and most recently, a district manager for the materials department.

Richard O. Grunewald has recently joined Hopkins Agricultural Chemical Co., Madison, Wis. as sales representative in Wisconsin and surrounding areas. Mr. Grunewald is a graduate in agriculture from the University of Wisconsin. He was formerly with Allis-Chalmers, Milwaukee.

●

Herbert R. Miller has joined the sales department of Texas Gulf Sulphur Co., according to an announcement by **A. Nelson Myers**, vice president and manager of sales.

Mr. Miller was formerly with the International division of Century Chemical Corp. and with Olin Mathieson Chemical Corp.

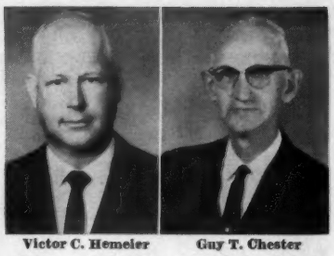
●

Derek Richardson has been appointed to the newly created post of vice president for marketing of the Chemicals Division of Olin Mathieson Chemical Corp., effective July 1. **John O. Logan**, vice president and general manager, chemicals division, made the announcement. Mr. Richardson's headquarters will be in New York. He joined the corporation in 1939 and was a member of the chemicals division until 1958, when he transferred to the metals division. Mr. Richardson attended Cambridge University in England, where he received a Master of Arts degree in 1938.

Derek Richardson

●

Robert C. Brady has been named sales coordinator of SunOlin Chemical Co., according to an announcement by **James I. Harper**, president. Mr. Brady will be responsible for coordinating the sales of urea and other chemicals from SunOlin's plants at Claymont, Delaware. In addition he will coordinate efforts for other products which may be marketed in the future.



Victor C. Hemeier — Guy T. Chester

Federal Chemical Co., division of National Distillers & Chemical Corp., has named **Victor C. Hemeier** and **Guy T. Chester** as division sales managers effective July 1. Mr. Hemeier succeeds **Floyd L. Lucas** who retired recently. The new appointee will be located at Butler, Ind. Mr. Chester replaces **W. M. Stallings** who also retired. Mr. Chester will be sales manager of the company's Humboldt, Tenn. division.

●

H. William Elder has been named supervisor-process engineering, for the phosphorus division of Hooker Chemical Corp. The announcement was made by **Robert E. Noble**, general manager of the division.

●

Virginia-Carolina Chemical Corp. has promoted **Charles H. Kelley** to manager of its bag division and **Ernest R. Lacy** to sales manager of its mining division.

Mr. Kelley was former assistant manager of V-C's multiwall paper bag operation. He succeeds **C. Bruce Rennie** who retired June 30. Mr. Kelley joined V-C in 1952.

Mr. Lacy joined V-C in 1923. He has been with the mining division since 1959.

●

The materials department of International Minerals & Chemical Corp. has announced two promotions: **Thomas A. Bruns**, Columbus, Ohio, was named regional sales manager at New York. He will be responsible for the sale of agricultural chemicals in Maine, Vermont, New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Maryland, Pennsylvania, Delaware, Rhode Island, Virginia, West Virginia and Canada. He joined IMC as a sales clerk in 1946.

●

Pennsalt Chemicals Corp. has appointed **Dr. Russell T. Nelson** as assistant supervisor of the agricultural chemicals section of its technical development department. The appointment was announced by **J. Drake Watson**, general manager of Pennsalt's agricultural chemicals division.

Dr. R. T. Nelson

Dr. Nelson received his doctorate from University of Minnesota, College of Agriculture, where he majored in agronomy and plant genetics.

Before joining Pennsalt, Dr. Nelson was agronomist for Great Western Sugar Co. in Longmont, Colo.

●

Mid-South Chemical Corp., Memphis, Tenn., has announced the appointment of **Leon M. Tucker**, as administrative assistant to **Harry Gunther**, manager of operations. Mr. Tucker has had 15 years experience in agriculture as manager of his family's farming operations in Arkansas.

●

Raymond S. Grupinski has been appointed administrative assistant to **Harry H. Phillips**, northeastern regional manager, announced **E. H. Smythe**, marketing director for American Cyanamid Co.'s agricultural division. In his new position, Mr. Grupinski will be involved with the marketing of the division's agricultural products.

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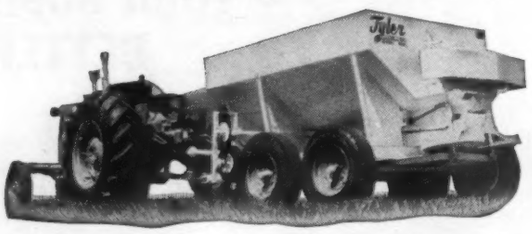

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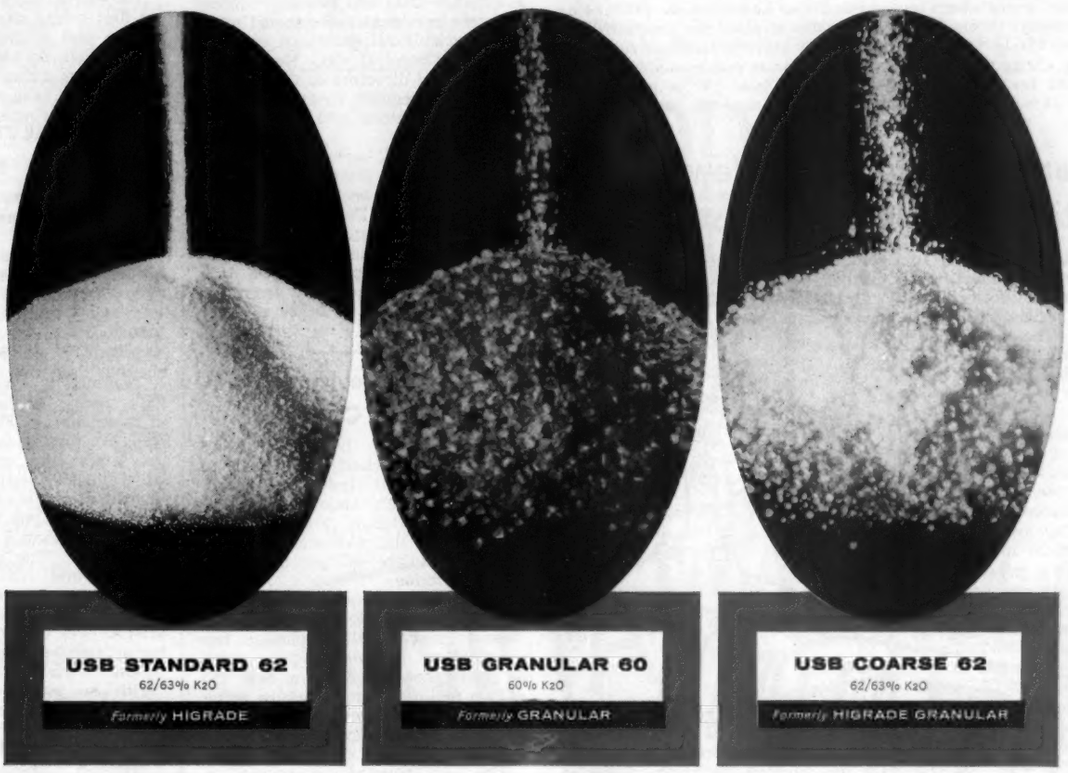

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SITE FOR NEW FACILITIES—Aerial photo of Spencer's Jayhawk Works, Pittsburg, Kan. shows areas where improvements or additions are planned or have been made recently. Circle "1" at top is site of plant for production of 30-10-0, new product. Circle "2" is location of new storage facilities for urea-containing solutions. Circle "6" is where construction is under way to provide additional nitric acid for use in making 30-10-0. Circle "4" is gas reform building. Numbers three and five designate areas used in production of nuclear fuels.

Spencer Plans to Manufacture New 30-10-0 Grade Fertilizer Product at Kansas Plant

PITTSBURG, KANSAS—Plans to manufacture a new solid fertilizer product at its Jayhawk Works have been announced by officials of Spencer Chemical Co. The new high-analysis product will be a 30-10-0 grade for use in the Midwest and South.

Construction will begin soon on a plant capable of producing more than 50,000 tons yearly of the new product for which Spencer intends to use the trademark "Mr. Greeen." The product will be the second solid fertilizer produced at Jayhawk. The first is "Mr. N" ammonium nitrate.

Byron Kern, vice president of Spencer's agricultural chemicals division, said that the decision to build the new plant follows successful test marketing this spring of 30-10-0 produced in temporary facilities at the Jayhawk Works. The 30-10-0 can be used for direct application to the soil or in the manufacture of various grades of mixed fertilizer either by conventional methods or by bulk blending, Mr. Kern reported.

Construction of the new plant at the Jayhawk Works is scheduled for completion in time for production during the 1962 fertilizer season. It will be located adjacent to the facilities for producing prilled ammonium nitrate and will use ammonium nitrate, phosphoric acid, and ammonia in producing "Mr. Greeen" with a Spencer-developed process.

NEW SYMBOL—Spencer Chemical Co. has adopted the above character as symbol for new 30-10-0 product. Figure will be known as "Mr. Greeen."

In adding 30-10-0 to its product lines, the company will not alter the pattern of distribution of solid fertilizers through manufacturers of mixed fertilizer, a Spencer spokesman said.

NAC Assn. Names Pair To Directorship Posts

WASHINGTON—Election of two new members to the board of directors of the National Agricultural Chemicals Assn. was announced recently by L. S. Hitchner, executive secretary of the association.

Howard J. Grady, president, Ortho Division of California Chemical Co., Richmond, Cal., and Daniel J. Keating, vice president and general manager, agricultural chemicals division, Stauffer Chemical Co., New York, were elected directors of the association at a regular meeting of the board of directors held in Washington in June.

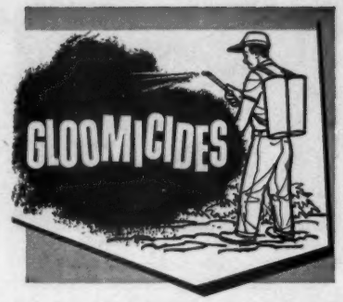
Mr. Grady will serve the unexpired term of Fred C. Shanaman, who resigned from the board upon his retirement from Pennsalt Chemical Corp. of Washington. Mr. Keating will serve the unexpired term of George R. Vila, president of U.S. Rubber Co., who resigned from the board due to press of other commitments.

New Corporate Name for Atlas Powder Company

WILMINGTON, DEL. — Atlas Powder Co. has changed its name to "Atlas Chemical Industries, Inc.," according to an announcement by Ralph K. Gottshall, president. The new name, Mr. Gottshall says, is more descriptive of the company's actual functions.

"We have become increasingly a manufacturer of chemicals," he said. "Recent moves will emphasize our chemical nature even more . . . work is almost completed on a new $15 million facility to manufacture anhydrous ammonia, urea, and related products, owned equally by Atlas and the Standard Oil Co. (Ohio) . . . "

The company makes emulsifiers used in the pesticide trade, and a number of other chemical products for industrial use.



Tall girl to saleswoman: "Do you have a skirt that will make me look shorter?"

Saleswoman: "No, but I have one that will make men look longer."

◆ ◆ ◆

The seventh-grader was going to his first school dance. With a rented tuxedo and a great display of sophistication, he was strutting across the campus when he met a Junior. "Yuh gonna take a girl?" asked the Junior. "Naw," answered the seventh-grader, "I think I'll just go stud."

◆ ◆ ◆

A firm, advertising their product, once stated: "Money returned if not satisfactory."

Someone applied for the return of his money, and the reply he received was: "Your money is quite satisfactory and therefore we decline to return it."

◆ ◆ ◆

Imagine, if you will, a jealous wife and a husband who believed in reincarnation. Finally the husband died. Keeping a pact they had had for years, the wife communicated with him in the spirit world, twelve months after his untimely demise.

"Are you happy there?" she asked.

"Happier than I ever was before," he replied. "The pastures here are greener, and it's indeed beautiful. And the weaker sex are the most gorgeous creatures you ever saw. Wistful eyes that speak of love; sleek bodies and beautiful rounded forms."

"Oh, dear!" she expostulated. "With so much temptation about you, I'm afraid you'll do something you'll be ashamed of. I do hope I can soon join you in Heaven."

"Heaven?" boomed back the reply. "Who said I was in Heaven? I'm a bull in Montana."

◆ ◆ ◆

As a man threatened to jump from the window of a tall building in a southern city, a policeman stood just out of reach and tried to persuade him not to jump.

"Think of your mother and father," pleaded the cop.

"Haven't any," came a surly reply.

"Well, think of your wife and family."

"Haven't any," this time in a growl.

"Your girl friend, then."

"I hate women!"

"All right, think of Robert E. Lee."

"Who's Robert E. Lee?"

"Jump, you damyankee!"

◆ ◆ ◆

Frank was talking to his wife, Alice, while the little old lady sat in the living room knitting. "Now, look, Alice," he whispered, "I don't want to sound harsh, but your mother has been living with us for twenty years now. Isn't it about time she got an apartment of her own?"

Alice gasped. "My mother?" she said. "I thought she was your mother."

ON STOCK EXCHANGE LIST

NEW YORK—Trading in the common stock of Stepan Chemical Co. began on the American Stock Exchange June 28. All of the company's 704,298 outstanding shares were listed on the exchange. The stock, formerly traded over-the-counter, was assigned ticker symbol SCM.

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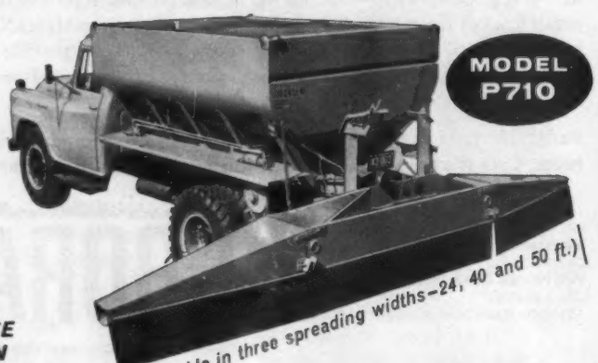

(Available in three spreading widths—24, 40 and 50 ft.)

2-4 TONS

Model N-28 (2 ton) and the N-48 (4 ton) shown, have unique no-spring, individual wheel suspension—all wheels carry equal weight at all times. These tractor pulled "compacts" make money as rental units.

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4-13 TONS

Model P710 shown, has a 7 ton capacity. Other "P" models available from 4 to 13 tons. All "P" models are available in 3 spreading widths, and can accurately spread by test—75 lbs. per acre on up.

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Effect of Fertilizers on Various Crops Discussed at Pacific Northwest Meeting

SALEM, OREGON—The effect of fertilizer application on the yield and quality of crops was a much-discussed topic at the 12th annual Pacific Northwest Fertilizer Conference at the Marion Hotel June 27-29. The meeting, sponsored jointly by the State agricultural institutions of Idaho, Oregon, Utah, and Washington and the Soil Improvement Committee of the Pacific Northwest Plant Food Assn., featured the presentation of papers by experts from the Universities involved, as well as a representative of the American Potash Institute.

Two researchers from Washington State University, R. Kunkel and I. A. Dow, told the effect of nitrogen, phosphorus and potassium on yield and quality of potatoes grown in the Columbia Basin. They reported that, in general, increasing the nitrogen content of fertilizers increases the yield and the number of smooth-skinned potatoes, and decreases slightly the specific gravity and blackspot intensity. Phosphorus responses were variable, although some unexpected increases in yield were noted. Increasing potash content tended to decrease total yield, but to increase the number of smooth-skinned tubers.

That nitrogen fertilization of Elberta peaches aids in gaining the quality necessary for canning was pointed out in a report by E. L. Proebsting, Jr., G. H. Carter, D. W. Ingalsbe, and A. M. Neubert, Washington State College. Fruit from trees deficient in nitrogen is of inferior quality when canned, the authors noted. Fruit from the higher nitrogen levels was judged to be superior in many ways. The authors concluded: "If properly handled, peach trees can be fertilized for maximum production and still produce excellent quality canned fruit."

R. E. Wagner, American Potash Institute, Washington, D.C., in a paper discussing the effect of fertilizers on quality forage, said that the key role played by fertilizer in quality forage lies in its providing a "quantity of quality." High fertility conditions permit sustained growth of high quality, he pointed out. "Without proper balance of fertility, not only can quality of forage be impaired, but physiological disorders in animals can be induced under extreme conditions."

In discussing the importance of balance in fertilizer applications, Mr. Wagner added that it is not always so much a matter of applying too much of one element as it is the failure to increase the level of certain other elements to maintain a balance. Such imbalances, he said, may be a factor in grass tetany and nitrate toxicity.

WEED CAUSES LAMB DEFORMITY

WASHINGTON — A poisonous weed, California False Hellebore, when eaten by ewes shortly after conception causes deformed on "monkey-faced" lambs, a U.S. Department of Agriculture veterinarian reports.

The finding that the weed, which is relished by sheep, causes this malformation resulted from research by Dr. Wayne Binns of USDA's Agricultural Research Service in cooperation with the Department's Forest Service and the Utah and Idaho Agricultural Experiment Stations.

The deformity has been known to occur for the past 50 to 60 years only in parts of southeastern Idaho, although the weed also grows on ranges in Utah, Wyoming, and Colorado. The condition, which causes losses to sheep producers up to $75,000 each year, has never been found in sheep bred outside these areas.

This malformation affects only the heads of lambs. A slightly deformed upper jaw may be the only indication of the condition, but in extreme cases — called complete Cyclops — lambs may have only a single eye in the center of their heads. Monkey-faced lambs born alive are killed by sheepmen because the lambs have trouble nursing.

U.S. Bids Asked for New Rhodesian Fertilizer Plant

WASHINGTON — A report showing results of a study on the potentialities for the production of nitrogenous fertilizer and explosives in the Federation of Rhodesia and Nyasaland, and inviting the collaboration of a U.S. firm for the establishment of a nitrogenous fertilizer factory, has been compiled by the Federal Ministry of Commerce and Industry.

The report describes the interest of the Federal Government in the local production of nitrogenous fertilizers, the demand for such fertilizer, the benefits which extended use would bring, and the facilities now existing for local manufacture.

The government said it is anxious that the fertilizer be produced at the lowest possible price and with maximum use made of local resources. At the present time there are three fertilizer manufacturing or mixing companies in the federation but none of them reportedly produces nitrogenous fertilizers. The study forecasts a demand of approximately 45,000 tons by 1966. (Interested U.S. firms should submit proposals before Sept. 30, 1961, to the Ministry of Commerce and Industry, P.O. Box 8019, Causeway, Salisbury, Md.)

A copy of the study, "The Production of Nitrogenous Fertilizers and Explosives in the Federation of Rhodesia and Nyasaland," is available on loan from the Trade Development Division, Bureau of Foreign Commerce, U.S. Department of Commerce, Washington 25, D.C.

PILOT DIES

JONESBORO, ARK. — Dale W. Loomis, 25, Medina, Ohio, was killed June 7 near here when his light plane, with which he had been applying herbicides, crashed in a field.

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Minnesota Conference Told:

Fertilizer Manufacturers Need Information on Minor Elements

MINNEAPOLIS, MINN.—Talks on the importance of minor elements topped off by a paper on future prospects for the fertilizer trade were featured at a meeting on June 29 of the Minnesota Fertilizer Manufacturers Assn. in Minneapolis. Plant food makers from not only Minnesota, but from some of the surrounding states were in attendance.

Speakers on the technical phases of minor elements included R. W. Starostka, supervisor, agricultural chemical research for W. R. Grace & Co., Clarksville, Md.; Frank G. Viets, Jr., soil scientist, Northern Plains Branch, Agricultural Research Service, USDA, Ft. Collins, Colo.; and John M. MacGregor, department of soils, University of Minnesota, St. Paul. Banquet speaker in the evening was Lawrence A. Long, editor of Croplife.

Mr. Starostka stated that understanding of minor element needs, usage, and technology is several years behind that of the three chief elements of plant food. This is partly due, he said, to the fact that deficiencies of minor elements are generally found in more localized areas and responses to these are often less dramatic.

The progression from natural organics to processed materials and increasingly higher analysis of materials has depressed the minor element content naturally existing in fertilizers, he said. But through research, the understanding of minor element needs will become clearer. He predicted that once this is established, requirements of these will be fulfilled as precisely as primary nutrient requirements are met today.

Exactly how many tons of minor elements are sold at the present time is difficult to assess, Mr. Starostka said. This is because such tonnages are generally reported only when sold to consumers as separate materials. In the upper Midwest, he said, most minor elements are applied in mixed fertilizers, which makes it difficult to determine actual tonnage.

Minor elements are supplied from a wide variety of materials, he said. Some are by-products, while others are processed inorganics, chelates, and frits. He said that borax, ferrous sulfate, iron chelates, copper oxide, copper sulfate, zinc sulfate, zinc chloride, and manganese sulfate are all being used in some areas of the Midwest at the present.

Consumers of minor elements may find it difficult to follow recommendations precisely, but the mixed fertilizer manufacturer who sells a complete fertilizer with minor elements knows which grades to recommend for certain crops. "Knowledge of the soils in the area, crops and recommendations will result in a reasonable basis for adding minor elements," he said.

That steady, reliable sources of minor elements are important was emphasized by the speaker. "Natural sources in short supply and by-product materials will not justify large-scale research and development programs. Increased emphasis will be placed on processed materials. Factors encouraging processed materials include more plentiful supplies of new raw materials and new materials of construction," he said.

"Efforts will be made to develop materials which will be effective over a broad spectrum of soils and crops. Primary consideration will be given to effectiveness. Preferably these materials could be used equally well on foliage, in mixed fertilizers, or for direct application to the soil. They should not create health hazards to workers and should not cake either alone or in mixed fertilizers.

"They should be non-burning, non-leaching and should not become easily fixed by the soil. Their availability, affected by moisture, temperature, etc., should be timed with crop requirements. Some of the newer materials being marketed or under development include the chelates, frits, boron silicate, ferrous oxolate and the metal ammonium phosphates."

Many Differences

Mr. Viets told the group that the subject of minor elements is an extremely broad one because of the wide differences in the materials. "The only thing minor elements have in common is the small amount needed by organisms . . . but this need must be met if the plant or organism is to survive," he observed. Otherwise, the elements are all different. This includes their chemistry, the jobs they do, and the deficiency symptoms they produce.

He named the minor elements most frequently needed by plants, listed symptoms and crops, and described how to diagnose minor element problems. He said that soil tests are not routinely used in laboratories for minor elements, but such tests are very useful when calibrated against field tests and field occurrence of deficiency symptoms.

Minor element needs, except iron, can usually be met by the use of inorganic salts applied in dry or liquid fertilizers. The amounts needed are usually so small (as low as 1 ounce for Mo to 100 pounds per acre for Zn in common carriers) that the material must be mixed with something else to achieve uniform distribution. Hence, products like borated superphosphate and aqua ammonia fortified with Zn are used in some localities. Mo treatment of legume seed has been successful. In many cases, application of the element in foliage sprays is the most successful.

Important as minor elements are in plant nutrition, excessive amounts can be toxic to plants or animals, Mr. Viets said. Because of potential hazards, Mr. Viets said he does not favor the "shotgun" method of using minor elements. "It is much safer to correctly diagnose the problem, work out a control, and then use the minor element in fertilizers on an area or prescription basis," he said.

Mr. MacGregor listed the minor elements and their need for various crops and soils in the state of Minnesota. He indicated that not all applications of minor elements have resulted in increased growth or yields in experiments conducted by the university. Applications of various minor elements on various crops had negative effects in most instances, the professor said.

Mr. MacGregor said, however, that it is not possible to locate experiments or to test soils on every field in all parts of the state, since soil nutrient needs vary greatly, even in a given single field. Therefore, he said, generalizations must be used in describing the nutrient situation. The instances of a proven need for the addition of boron, copper, molybdenum, zinc, iron, manganese, to Minnesota's soils have been comparatively few, the soils expert said, so farmers are urged to experiment themselves on small fields to determine whether application of such nutrients is necessary.

A talk on the present direction of the fertilizer industry was presented by Mr. Long following the banquet on the evening of June 29. He said the long-term prospects for the industry are good, with greater tonnages, wider acceptance, and better business methods in the offing. Other favorable factors include the population boom, the withdrawal of agricultural lands for urban developments, and the American standard of living which will make mandatory the optimum fertilization of remaining acres.

However, the editor said, many of these things are some little distance ahead, and the industry may experience rough detours before arriving at a greater day.

The granting of "crazy" credit terms to farmers will have to be corrected before the industry can realize its full potential, and the profit margin will have to become greater to allow for added services being demanded by customers. Such services include soil testing, prescription mixes, and application services. This pressure, along with other factors, including the availability of high analysis materials, has brought on the rise of the blender, particularly in the midwestern states.

The possibility of a large food cache on a national scale, to assure a food supply in event of an atomic attack, was suggested as one means of making use of surplus agricultural production and indirectly creating an extra market for the fertilizer industry.

Dr. William P. Martin, head of the soils department, University of Minnesota, was toastmaster at the banquet. Ozzie Arlien, Minnesota Farm Bureau, president of the Minnesota Fertilizer Manufacturers' Assn., was general chairman of the meeting.

PREDICTIONS

Continued from page 15

velopments in the area of food technology, with ready-to-cook products and "instant" foods coming more and more into the picture. Some predict that food items will be packaged in soluble, edible containers one day.

Analysis of food components, pesticide residues and food additives will be speeded up and made accurate in the parts per billion range by improved instrumentation and automation of procedures.

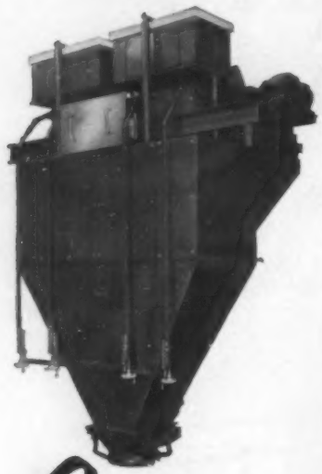
Farm forests today are a substantial source of raw material for the wood using industry, and hence any discussion of farming in the future merits attention to the future of forestry.

There will be an increased use of hardwoods, almost complete dependence upon artificial regeneration, and considerable use of fertilizer.

We will see general use of certified genetically superior planting stock with an increase of 2 or 3 times the present growth rate, and we can anticipate complete mechanical harvesting of planted pine.

The world about us won't change overnight. But as we consider the likelihood of all these great scientific and technological developments here in the U.S., let's consider that in countries only a few hours' flight away, agriculture still means peasantry, the hand hoe, the machete and back-breaking toil from dawn to dusk, with hunger all around.

My question, and I believe it is a sensible one, is this: "How long can we Americans continue to enjoy the benefits which science and technology are providing, while much of the rest of the world lags far behind? Is it or is it not in our national interest to encourage similar developments elsewhere?" As populations grow and the world becomes smaller, the major problem ahead will be people and their relations with one another.



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NPFI CONVENTION

Continued from page 4

By "future," he explained that he meant a time perhaps a quarter-century away, rather than the immediate years ahead.

"Yields of many field crops may be two to four times present yields an acre," he said, and farmers everywhere will be making 200-300 bu. corn to the acre, and growers of other crops will likewise be reaping tremendous harvests. (Full text of Mr. Fifield's talk appears elsewhere in this issue of Croplife.)

Mr. Freeman, in discussing "Agriculture Is Everybody's Business," told the convention that the farmer accounts for a market of some $40 to $50 billion which is used to buy all types of commodities, "from lipstick to motor trucks." Despite this, the secretary said, the farmer has been put in a kind of economic isolation ward, with his problems being treated as though they affected him alone.

Nearly a decade of emphasis on surpluses and subsidies has given the plight of the farmer a false perspective, obscuring the fact that economic maladies affecting agriculture sap the strength and vigor of our whole economy. "When the farmer is in trouble, a lot of other people are likely to be in trouble, too," he said.

The USDA head then quoted some figures which he said prove that the farmer today is really in trouble. "In 1960," he said, "when the per capita income of our non-farm population averaged $2,282, the income of farm people averaged $986. Farm labor brought 82¢ an hour in contrast to $2.29 earned by the average factory worker and the $1.15 minimum wage law now prescribed by law."

Mr. Freeman expressed confidence that the Congress will cooperate with the present administration in "getting at the root of this basic maladjustment in our economy. We must, and we will, increase farm income to a level commensurate with that of other sectors of the economy . . . and we intend to do so by enabling farmers themselves to work out ways of assuring a fair return for their investment of capital, labor and skill."

Yet, the secretary continued, the farmer's image in the public mind is bad. "For nearly 10 years, he has been scolded and derided as the creator of surpluses and the recipient of subsidies. Consumers think he is responsible for high food prices; taxpayers consider him responsible for high taxes; and a large part of the non-farm public imagine him as a fellow in well-cut overalls behind the wheel of a Cadillac paid for by Uncle Sam."

Mr. Streetman, representing the views of a private business concern which sells to farmers, denied that agriculture is in as bad shape as it is sometimes pictured. "A lot of what we have read and heard might lead us to believe agriculture is a declining industry, in pretty bad shape," he said. But "nothing could be further from the truth."

"Agriculture is the nation's biggest industry," he said, pointing out that "it employs more workers than the steel industry, or the automobile industry, or transportation and public utilities combined. Investment in agriculture exceeds $203 billion. Farmers spend over $25 billion for goods and services to produce livestock and crops."

"Each year our farms use more science, more technology. Brain power is replacing horsepower. While the number of farm workers has declined 3 million in the last decade, U.S. agricultural output has increased two thirds. This decline in farm population although viewed by some politicians with alarm is in itself a sign of a strong, healthy industry. And the remarkable increase in production efficiency can be matched by no other sector of our American economy."

Mr. Streetman said that the man who needs the fertilizer industry's products "is not going out of business, he's going into a bigger business. His investment is larger, his risks are greater. But this larger, more efficient farmer of today approaches his problems and studies his investments as an industrialist does. He demands of his suppliers technical competence and a clear understanding of his operating problems. As we learn to concern ourselves less about his size and more about his needs we will earn not only his business but his respect and his loyalty as well. In the long run, how well we serve will determine how well we prosper."

Mr. Streetman tod about his organization's program for the retail dealer and the independent farmer who still is free to make his own marketing decisions. He described the foundation of dealer business management as having six business-building cornerstones "proven over the years by hundreds and hundreds of successful and profitable . . . dealers.

"The first of these cornerstones is a market analysis," he said. "The second . . . is organized outside sales and service; the third . . . is group selling; the fourth . . . is what we call the big 'C'—creating, contracting or check-r-mix; the fifth . . . we call proof projects; the sixth . . . is advertising and promotion."

Nitrogen producers and potash producers sponsored hospitality hours on Monday and Tuesday evenings, June 12 and 13, respectively, with the annual NPFI banquet being held on Tuesday evening.

Golf, tennis, horseshoe pitching, shuffleboard, horseback riding, putting, bridge and Canasta were included on the sporting agenda for men and their wives attending the convention. Committee chairmen were: W. R. Morgan, Hydrocarbon Products, Inc., New York, golf; Tracy L. Adcock, Swift & Co., Chicago, horseshoes; Dr. Richard B. Bahme, NPFI, tennis; Mrs. Fred J. Corkill, U.S. Borax & Chemical Corp., Los Angeles, ladies' golf and putting; Mr. and Mrs. W. G. Copeland, Olin Mathieson Chemical Corp., Little Rock, Ark., hospitality, and Mrs. John W. Hall, ladies' activities.

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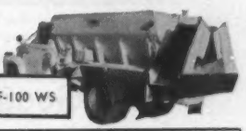

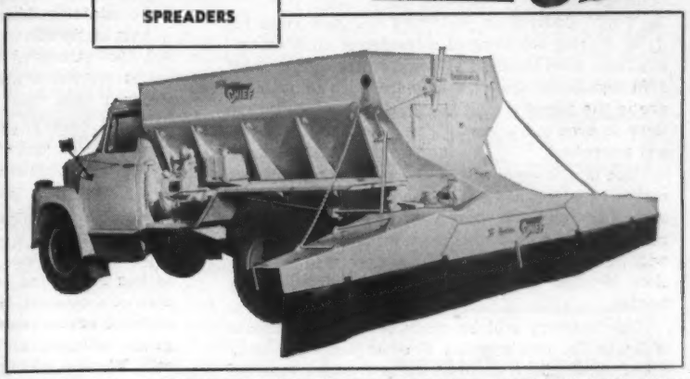

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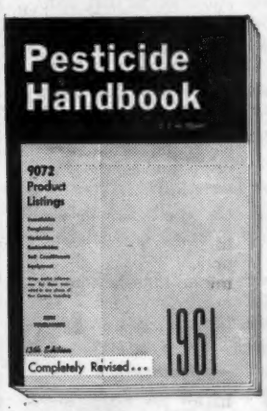

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about the editor—

Dr. Donald E. H. Frear, Editor of PESTICIDE HANDBOOK 1961, is one of the leading authorities on the chemistry of pesticides. He is the author of "Chemistry of Insecticides and Fungicides," the first book dealing with this subject published in the United States. In addition, he has written several other books, including "Chemistry of Insecticides, Fungicides and Herbicides." Dr. Frear is Professor of Agricultural and Biological Chemistry at the Pennsylvania State University.

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A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

New Pesticide Laws Both Good and Bad

NEW TAXES on pesticides and new rules requiring licensing of salesmen of such materials have been imposed by some states during their 1961 legislative sessions. Happily, such regulations are in the minority, but the existence of restrictive laws in even a few commonwealths sets a dangerous precedent.

One of the areas which the trade should watch carefully is the State of Oregon which enacted a special tax on 2,4-D, based on the weight of active materials. Whether the manufacturer or retailer will be assessed appears to be open to interpretation. Neither wants to be saddled with such a burden.

The industry will be quick to note the effects of South Carolina's action. Fees on pesticides were hiked some 450% in order to get added revenue to cover registration expenses and to step up laboratory staff work in connection with pesticide regulations.

And in the State of Washington, lawmakers were frank to admit that their new rule, to license all persons selling pesticides, was designed to reduce pesticide sales. Revenue from licenses will be used to enforce the state laws concerning the use of pesticides.

However, these are but three states out of fifty. To the credit of others, legislators in quite a number of states saw fit to pattern their laws after the federal act which is regarded by the industry as being both fair and firm enough.

The trade should be reminded that state legislators are sensitive to "incidences" where misuse of pesticides causes damage to crops, domestic animals or wildlife. The howls of outraged people who have found a dead robin, can drown out the logic of volumes of technical literature indicating that a given toxicant is harmless if used correctly.

NPFI Heads Comment On Institute's Future

ANY MOVE made by a trade association is watched closely by its constituents and also by non-members in the field. This is natural. But when a group of national stature is rumored to be "retrenching" or "cutting back," hearsay "information" has a tendency to become exaggerated and to practically get out of hand.

This was almost the case with the National Plant Food Institute in its recently-announced realignment due to a reduction in budget. People in attendance at the NPFI annual meeting were subjected to all kinds of whispers about drastic action to come from the Institute shortly, with dire predictions growing worse with each telling.

What then is the true picture? The best sources of direct information are some of the Institute's officers. John W. Hall, president of the Potash Company of America and newly-elected chairman of the NPFI's board of directors, said there will be no major changes in the Institute's program for the 1961-62 fiscal year, although some alterations will be noted because of the reduction of the budget. Mr. Hall emphasized that "these reductions will not impair the program for the organization or result in any de-emphasis of the traditional support and cooperation that the Institute has been privileged to enjoy with the land-grant colleges, agricultural workers, and others concerned with a sound agriculture."

He added that the organization "will continue to place appropriate emphasis" in these four primary fields of activity:

1. Legislation and administrative work with federal and state agencies.
2. Publicity and public relations.
3. Broad market promotion, including agronomic activities and continued cooperation with state and local officials in their Intensified Soil Fertilizer Programs; and
4. Maintaining liaison and service to members of NPFI.

Mr. Hall indicated that some reduction in personnel is inevitable under a reduced budget, but emphasized that the regional approach to the problems of industry and agriculture will be continued, largely within the present operational framework.

Paul Truitt, president of NPFI, told Croplife in an interview that the Institute will continue its work with the agricultural experiment stations throughout the country, as has been done for years. "The Institute acts as a catalyst for the promotion of agricultural advancement, along with the land-grant colleges, and will continue in this role. We are taking a progressive step and will utilize the talents of our staff fully to improve the job ahead.

"Actually what NPFI is doing should better be described as 'program modernization'," Mr. Truitt said. "We have already developed much support for numerous worthwhile projects, such as the Intensified Soil Fertility Program which has made its influence felt over a wide area. Starting with a program in only six counties, it now has some 300 counties in its program and more are being added continually. Approximately 1,500 agricultural counties can benefit from this program as it is being sponsored by the colleges and the extension services."

Thus, the terms "program modernization" and "progressive step," plus the declaration by Mr. Hall of the four fields in which NPFI expects to continue its emphasis, would appear to project a constructive course for the future.

Mature Personnel in Plant Helps Everyone

MATURITY in human beings is not achieved easily. Plant supervisors who deal with employees day in and day out, becoming acquainted with their foibles, strong points, and weaknesses, at times wish some of these fellows would "grow up."

What "growing up" means in terms of maturity has been outlined quite well by John E. Smith, Spencer Chemical Co., and published in that company's "Safety Comments." The mature person, according to Mr. Smith, has the following characteristics:

1. He does not expect special consideration from anyone.
2. He accepts his **safety** responsibility.
3. He controls his temper.
4. His feelings are not easily hurt.
5. He is a good loser—can take defeat or disappointment without whining or complaining.
6. He knows that whenever he takes a chance, he can be injured.
7. He does not worry unduly about things that cannot be helped.
8. He accepts responsibility for his own acts.
9. He does not boast or "show off" in socially unacceptable ways.
10. He believes safety is a way of life.
11. He is not a chronic fault-finder.
12. He listens thoughtfully to the opinions of others, and does not argue heatedly, when his views are opposed.
13. He has outgrown the "all-or-nothing" stage, recognizing that no person or situation is wholly good, or wholly bad.
14. He does not substitute for **safety**.

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July 30-Aug. 2 — Soil Conservation Service Society of America, annual meeting, Purdue University, Lafayette, Ind.

Aug. 10-11—Mississippi Soil Fertility and Plant Food Council, annual meeting, Biloxi, Miss.

Aug. 16-20—Canadian Fertilizer Assn. annual convention, Manoir Richelieu, Murray Bay, Quebec. R. P. Pennington, 2 Carlton St., Toronto 2, Ont., secretary-treasurer.

Aug. 27-30—Annual meeting of American Society for Horticultural Science, Purdue University, Lafayette, Ind.

Sept. 10-13—Farm Equipment Institute, 68th annual convention, Palmer House, Chicago.

Sept. 10-14—National Assn. of County Agricultural Agents, 46th annual meeting, Waldorf-Astoria Hotel, New York.

Sept. 17-20 — Canadian Agricultural Chemicals Assn., 9th annual meeting and conference, Mont Tremblant Lodge, Mont Tremblant, Quebec.

Oct. 4 - 6 — Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 9-11—Western Agricultural Chemicals Assn., annual meeting, Hotel Claremont, Berkeley, Cal.

Oct. 12-13 — Northeastern Fertilizer Conference, Chicopee, Mass.

Oct. 16-20 — Fertilizer Section, National Safety Council, annual meeting, Pick-Congress Hotel, Chicago.

Oct. 29-Nov. 1—National Agricultural Chemicals Assn., 28th annual meeting, Homestead Hotel, Hot Springs, Va.

Oct. 30-Nov. 1—Fertilizer Solutions Assn. annual convention, Edgewater Beach Hotel, Chicago, Ill.

Nov. 2-3 — Pacific Northwest Plant Food Assn. annual convention, Hotel Gearhart, Gearhart, Oregon.

Nov. 7-10—Packaging Machinery Manufacturers' Institute Show of 1961, Cobo Hall, Detroit, Mich.

Nov. 12-14 — California Fertilizer Assn., thirty-eighth annual convention; Jack Tar Hotel, San Francisco.

Nov. 27-30—Entomological Society of America, annual meeting, Miami, Fla.

Nov. 27-30—American Society of Agronomy annual meeting, with Soil Science and Crop Science Societies included, Sheraton-Jefferson Hotel, St. Louis, Mo.

Dec. 11-14—Weed Society of America, annual meeting. Sheraton-Jefferson Hotel, St. Louis, Mo.

Dec. 14-15—Ohio State Fertilizer and Lime Conference, Agricultural Administration Building, Ohio State University.

1962

Jan. 10-12 — Agricultural Ammonia Institute, eleventh annual convention, Sheraton-Jefferson Hotel, St. Louis, Mo.

Jan. 17-19, 1962 — Southern Weed Conference, Hotel Patten, Chattanooga, Tenn.; Dr. R. E. Frans, Dept. of Agronomy, University of Arkansas, Fayetteville, secretary-treasurer.

Jan. 18-19—Southern Farm Forum, 15th annual meeting, Roosevelt Hotel, New Orleans, La.

Feb. 12-13—Short Course on Fertilizer Technology, sponsored by Soil Science Society of America, Purdue University.

Feb. 15-16—Joint Meeting of Midwestern Agronomists and Fertilizer Industry Representatives, annual meeting sponsored by National Plant Food Institute, Edgewater Beach Hotel, Chicago.

Florida Fertilizer Firm Changes Corporate Name

PALMETTO, FLA. — "Producers Fertilizer Co." is the new name for the former Producers Supply, Inc., at Palmetto. According to J. E. B. Asbell, president, the former name did not indicate the kind of business the company is in, and the company has received authority from the Florida secretary of state to change its name.

"There will be no change in the company as to any of the people connected with it, either as stockholders, directors, officers, or any of the employees," Mr. Asbell said. He added that there will be no changes in company policies, and that the new company will assume all of the obligations of the original one.

Federal Chemical Buys Farm Fertilizers, Inc.

OMAHA, NEB.—Federal Chemical Co., Louisville, Ky., a division of National Distillers and Chemical Corp., has completed arrangements to acquire Farm Fertilizers, Inc., Omaha, through an exchange of stock, according to a joint announcement by Jefferson D. Stewart, Jr., Federal president, and Richard E. Bennett, president of Farm Fertilizers.

The latter company is a manufacturer of pelleted chemically combined fertilizers and complete liquid fertilizers with a major plant in Omaha and two smaller plants at Fremont, Neb., and Webster City, Iowa.

Farm Fertilizers employs 100 office and plant workers. The present management of the company will continue to operate the business after the acquisition has been completed. Farm Fertilizers, Inc., has been in business 13 years and markets its products in the Iowa-Nebraska area under the brand name "Bumpero Fertilizers."

Farm Fertilizers will now become an integral part of Federal Chemical, increasing to 10 the number of its plants. The acquisition will open two new states to Federal, which now will serve a marketing territory of 12 farm states in the mid-south and midwest, ranging from the Gulf of Mexico to the Great Lakes.

To Build Urea Plant For Japanese Firm

NEW YORK—Chemical Construction Corp. has been awarded a contract by Nihon Gas Kagaku Kogyo KK, for the redesign of a urea plant at Niigata, Japan. Chemico's new total recycle urea process will be employed in the plant.

Lou Cook, chief engineer of Chemico's Urea Division, reports that Nihon's present urea capacity will be increased from 80 to 150 metric tons a day using the new process which employs the principle of carbamate solution recycle. This facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials.

Construction Begins on 35,000-Ton Urea Plant

TORONTO — Sherritt Gordon Mines, Ltd., has announced the start of construction on a urea plant at Fort Saskatchewan, Alberta, Canada. The plant will have the capacity of 35,000 tons a year and will produce urea in both prill and crystal forms. Production is scheduled to start in the second half of 1962.

Urea, containing 46% nitrogen, is the highest analysis solid nitrogen fertilizer available at the present time. It is also used extensively as a plant supplement in cattle feed, and important tonnages are used in the manufacture of adhesives for plastics, ammonia and carbon dioxide. The essential raw materials for the manufacture of urea are available at low cost from the company's present operations at Fort Saskatchewan.

Sales will be handled through Harrisons and Crosfield (Canada), Ltd., Toronto, exclusive sales agent for Sherritt fertilizer and chemical products.

TWO JOIN TVA STAFF

KNOXVILLE, TENN. — Drs. Charles F. Douglas and Warren J. Sharratt have been appointed fertilizer distribution analysts with the division of agricultural relations, Tennessee Valley Authority. Their offices are at Muscle Shoals, Alabama. Dr. Douglas formerly was research instructor in agronomy at Purdue University, and Dr. Sharratt was research assistant in soils at the University of Wisconsin.

CALENDAR FOR 1961-62

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29	30					

MAY

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JUNE

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24	25	26	27	28	29	30

Classified Ads

Classified advertisements accepted until the fifth of each month for that month's issue.

Rates: 20¢ per word; minimum charge $3.00. Situations wanted, 15¢ a word; $2.25 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 25¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $12 per column inch.

All Want Ads cash with order.

SITUATIONS WANTED

PESTICIDE EXPERT, 15 YEARS' DIVERSified experience, formulations, research, plant design, construction, start-up and management. Can establish you in this field or make you more competitive. Patents, many processes, top references. Address Ad No. 7018, Croplife, Minneapolis 40, Minn.

HELP WANTED

LARGE CHEMICAL COMPANY SUPPLYing plant foods, pesticides and feed additives needs salesmen with 3-8 years' selling experience in one or more of these areas. B.S. degree in agriculture, chemistry or chemical engineering preferred. Send resumé to W. R. Hayes, Monsanto Chemical Co., Agricultural Chemicals Division, St. Louis 66, Mo.

DISTRICT SALES MANAGER

Nation's largest producer of plant food materials has current openings in the Midwest and in the South to sell Agricultural Chemical Materials. Requires sales experience preferably in the agriculture field. Should have college degree with emphasis on agriculture or related subjects. This is an excellent opportunity for a sales minded man who can plan and follow through. Our staff provides the agricultural industry with the nationally known IMC Total Service Program.

Send complete resume to F. W. Luck, Personnel Manager, Administrative Center, INTERNATIONAL MINERALS & CHEMICAL CORP. Skokie, Illinois

MACHINERY FOR SALE

BAG CLOSING SEWING MACHINES

Specializing in repairing and overhauling Fischbeins, Union Special and Minneapolis machines. Complete line of machines, conveyors, parts, thread and oil for sale. All repairs guaranteed.

PArkview 2-4087

ROBERT E. MAYSE CO.

620 W. Victoria Ave., Montebello, Cal.

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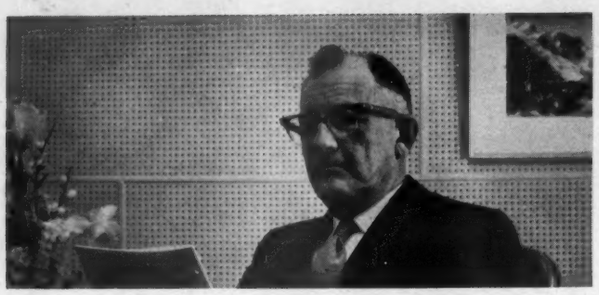

How to buy Anhydrous Ammonia and Nitrogen Solutions

by George Day

About the Author. Twenty-four years' experience serving customers are George Day's qualifications for writing about buying and selling an industrial commodity. For the last six of his 24 selling years, George has been working with customers who buy Ammonia and Nitrogen Solutions.

* * *

In the purchase of NH_3 and Nitrogen Solutions, look for a supplier with a good reputation. This kind of supplier has built up his good name probably over many years at great expense and he has a strong desire to see that this good name is preserved. When this is the case, it is the buyer who benefits.

Being a good supplier includes all of the routine things expected of such a source—the keeping of promises, dependable deliveries, quality that meets or exceeds specifications, etc.

However, there is much more to a good reputation. There is the matter of having the initiative to go beyond the routine, plus the willingness to do a little more than is necessary to get the business. Superior traffic know-how is among these. Being able to let a customer know exactly when to expect delivery, and knowing intimately the routing and timing of shipments are items to look for when deciding on an Anhydrous Ammonia and Nitrogen Solutions supplier.

Perhaps I wouldn't list these suggestions for selecting a supplier if I hadn't seen from experience how much they mean to *our* customers.

* * *

Would you like this kind of help with your purchases of Anhydrous Ammonia and Nitrogen Solutions? Call American Oil Company.

AMERICAN OIL COMPANY
910 SOUTH MICHIGAN AVENUE
CHICAGO 80, ILLINOIS

AMERICAN